Scarcity pricing Code amendments

Final decision

Executive summary

The scarcity pricing regime is set out in Parts 8 and 13 of the Electricity Industry Participation Code 2010 (Code). Under the regime, if an electricity supply emergency causes forced power cuts (typically referred to as emergency load shedding) in one or both islands, the system operator notifies the pricing manager, triggering the scarcity pricing regime. The regime is intended to provide increased certainty of spot electricity prices during these emergency situations, as spot prices can be significantly affected by the forced reduction in electricity demand. In a scarcity pricing situation, the scarcity pricing regime sets a $10,000 per megawatt hour (MWh) price floor and a $20,000 per MWh price cap for the island generation weighted average spot price (GWAP) in the trading periods affected by the emergency.

On 26 April 2016, the Electricity Authority (Authority) published a consultation paper that identified six operational issues with the scarcity pricing regime (consultation paper). The Authority considered that these issues would impede the regime's ability to operate in a correct and predictable way. As discussed in paragraphs 1.3—1.6 of this paper, impeding the regime's operation in this manner would reduce both its durability, and consequently, the positive net benefits identified for the regime in the cost-benefit analysis behind the Code amendment that introduced it (original scarcity pricing amendment).[1]

The consultation paper proposed Code amendments to resolve the six operational issues, and to prevent unintended consequences in operating the scarcity pricing regime. Consistent with the Authority's statutory objective under section 15 of the Electricity Industry Act 2010 (Act), this would promote the following for the long-term benefit of consumers:

- the efficient operation of the electricity industry
- reliable supply by the industry.

The Authority has considered submissions on the consultation paper and has decided to proceed with the proposed amendments, with some refinements. This paper sets out:

- the Authority's decisions on the proposed amendments, including the refinements the Authority has made to these amendments relative to the proposals the Authority consulted on, along with:
    - the reasoning for the refinements
    - analysis on whether the refinements change the Authority's overall position on the proposed amendments, as outlined in the consultation paper's regulatory statement and summarised in paragraph 1.11 of this paper
- certain points raised in submissions on the consultation paper that the Authority will consider in the context of its work on real-time pricing (RTP)
- the Authority's intention to assist participants' understanding of the process that the scarcity pricing regime follows, by preparing and publishing a detailed flowchart showing each step in the process

1 The Electricity Industry Participation (Scarcity Pricing) Code Amendment 2011 came into effect in June 2013, and is available at http://www.ea.govt.nz/code-and-compliance/the-code/amendments/2011-code-amendments/. The cost-benefit analysis for the original scarcity pricing amendment is set out at Appendix E of the consultation paper for this amendment, which is available at: http://www.ea.govt.nz/about-us/what-we-do/our-history/archive/dev-archive/work-programmes/market-wholesale-and-retail-work/scarcity-pricing/consultations/#c13855.

- the drafting for the Code amendments, including the refinements noted above.

Contents

1 The Authority has decided to amend the Code to address the operational issues with the current scarcity pricing regime identified in the consultation paper

The scarcity pricing regime provides a price floor and a price cap to reduce the negative effects of emergency load shedding

1.1 Under the Code's scarcity pricing regime, if an electricity supply emergency causes emergency load shedding in one or both islands, the system operator notifies the pricing manager, triggering the scarcity pricing regime. In a scarcity pricing situation, scarcity pricing sets a $10,000 per MWh price floor and a $20,000 per MWh price cap for the island GWAP in the trading periods affected by the emergency.

1.2 Emergency load shedding suppresses spot electricity prices as the remaining demand can be met with lower cost generation than would otherwise have been required. The scarcity pricing regime is intended to give investors in last-resort generation plant and demand response capability confidence that emergency load shedding will not undermine the business case for investing in those resources. The regime also aims to:

(a) give more assurance to wholesale purchasers that spot prices in emergency load shedding will not settle well above the level expected in a workably competitive market

(b) encourage purchasers to carefully assess their spot market exposure and obtain sufficient hedge cover to achieve their desired risk levels.

The benefits of the scarcity pricing regime depend on its durability

1.3 The cost-benefit analysis behind the original scarcity pricing amendment found that the regime could give rise to net economic benefits of approximately $40 million to $138 million in net present value terms.[2]

1.4 However, the cost-benefit analysis for the original scarcity pricing amendment also noted that the economic benefits identified were sensitive to the assumptions behind the analysis, which included a number of uncertain variables.

1.5 In particular, the net benefits were based on the assumption that the scarcity pricing regime would be durable and that participants would perceive it as such. The cost-benefit analysis for the original scarcity pricing amendment noted that, to the extent that this assumption did not hold, the net benefits of the regime would decline. This would occur if the regime produced outcomes that sent the wrong signals to participants and investors, encouraging them to overinvest or underinvest in last-resort generation plant and demand response capability.

1.6 A critical factor in determining the durability of the scarcity pricing regime is whether, in the context of emergency load shedding, the regime operates in a correct and predictable way. For this to occur, the Code obligations on the market operation service providers (MOSPs) that operate the regime (the system operator and the pricing

[2] See above at n1.

manager) must fit together and work in a clear and methodical way that produces logical outcomes.

The Authority's consultation paper identified six operational issues with the current scarcity pricing regime

1.7 The consultation paper identified six issues with the scarcity pricing regime that would impede its ability to operate in a correct and predictable way. This would reduce the regime's durability, which in turn would reduce investors' confidence that emergency load shedding would not undermine the business case for investing in last-resort generation plant and demand response capability. As outlined above, in such circumstances, the net benefits of the scarcity pricing regime would decline.

1.8 The six operational issues the consultation paper identified were:

(a) Issue 1: the regime is unclear regarding which trading periods the system operator should specify in a notice relating to an event or an instruction to disconnect demand

(b) Issue 2: the regime does not allow the pricing manager enough time to publish notice of and resolve an infeasibility or metering situation that, by coincidence, exists at the same time as a shortage situation, before subsequently giving notice of the shortage situation

(c) Issue 3: the regime does not allow for any delays (which can occur due to reasons outside the pricing manager's control) in the pricing manager resolving provisional price situations

(d) Issue 4: if interim prices change after the pricing manager publishes them, the regime does not require the pricing manager to recalculate and republish interim prices using the scarcity pricing methodology in Schedule 13.3A of the Code

(e) Issue 5: the regime's deadline for the pricing manager to calculate and publish interim prices using the scarcity pricing methodology under Schedule 13.3A is too tight

(f) Issue 6: there is a typographical error in the Code's formula for calculating island GWAP.

Resolving the six operational issues will promote the efficient operation of the electricity industry

1.9 The consultation paper proposed Code amendments that would promote the efficient operation of the industry for the long-term benefit of consumers by resolving the operational issues noted above. Without the amendments, the operational issues would impede the scarcity pricing regime's ability to operate in a correct and predictable way.

1.10 The Authority's view outlined in the consultation paper was that resolving these issues would also promote an efficient level of reliable supply in the industry, which is also consistent with the Authority's statutory objective.

1.11 The consultation paper's regulatory statement set out the Authority's overall position that:

(a) the proposed amendments:

(i) would be an improvement on the status quo, because continuing with the status quo would leave the operational issues listed above unresolved. This would have the negative consequential effects of reducing the regime's durability and reducing the positive net benefits identified for the regime in the cost-benefit analysis for the original scarcity pricing amendment

(ii) would deliver benefits that outweighed the costs of making the proposed amendments

(iii) under section 32(1)(c) of the Act, are desirable to promote the efficient operation of the industry

(b) as the operational issues concerned problems with the existing scarcity pricing regime in the Code, there were no alternative means for achieving the objective of the proposed amendments.

1.12 As outlined in greater detail in sections 2 and 3 of this paper, the Authority has reviewed submissions on the proposed amendments and considers that the overall position in the regulatory statement summarised in paragraph 1.11 above remains valid.

2 The Authority has considered the submissions on the proposed Code amendments

2.1 The Authority consulted on the proposed amendments from 26 April 2016 until 7 June 2016.

2.2 The Authority received and considered submissions from:

(a) Contact Energy Limited (Contact)

(b) Genesis Energy Limited

(c) Major Electricity Users' Group (MEUG)

(d) Meridian Energy Limited (Meridian)

(e) Mercury Energy Limited (Mercury)

(f) Transpower New Zealand Limited

(g) Pioneer Energy Limited (Pioneer)

(h) NZX Limited (NZX).

2.3 The common themes in the submissions were:

(a) most submitters considered that the proposed amendments would address issues with the scarcity pricing regime that the Authority should resolve. However, Pioneer and NZX raised concerns and suggestions in relation to several of the proposed amendments. Contact and NZX also each raised an additional issue with the regime that they considered the proposed amendments did not address

(b) most submitters agreed with the position put forward in the consultation paper that:

(i) there were no alternatives for achieving the objective of the proposed amendments

(ii) by correcting and clarifying aspects of the scarcity pricing regime, the proposed amendments would support the delivery of the positive net benefits identified in the cost-benefit analysis for the original scarcity pricing amendment.

2.4 For each of the six operational issues described in the consultation paper, section 3 of this paper outlines:

(a) the Authority's decision on the Code amendment proposed to resolve the relevant issue

(b) any refinements the Authority has made to the proposed amendments the Authority consulted on, along with:

(i) the reasoning for the refinements

(ii) analysis on whether the refinements change the Authority's overall position on the proposed amendments, as summarised at paragraph 1.11 above.

2.5 Several submitters also questioned whether the Authority's proposed amendments for Issues 4 and 5 in the consultation paper were consistent with the Authority's increasing focus on RTP.[3] Section 4 of this paper outlines the Authority's position on this.

2.6 Two submitters considered that the scarcity pricing regime and associated regulatory arrangements were too complex. Section 5 of this paper outlines the Authority's intention to assist participants' understanding of the process that the regime follows by preparing and publishing a detailed flowchart showing each step in the process.

2.7 Appendix A of this paper sets out the drafting for the Code amendments, including the refinements outlined in section 3.

3 The Authority has decided to proceed with the Code amendments proposed in the consultation paper, with several refinements

Proposed amendment for Issue 1

3.1 The Authority has decided to proceed with the proposed amendment for Issue 1, with one refinement as outlined in paragraphs 3.3–3.5. The consultation paper proposed to clarify the trading period(s) to which the system operator's notice under Technical Code B of Schedule 8.3[4] applied by amending:

(a) clause 5(2)(d) of Technical Code B of Schedule 8.3 so that the system operator's notice specified the start and end times of the situation to which the notice applies, rather than the trading periods

(b) clause 13.144 to require the pricing manager to specify in the notice it publishes under clause 13.144(1)(a), only those trading periods in respect of which the infeasibility, metering, high spring washer price, or shortage situation was in effect at the start of the relevant trading period(s).

3 As outlined in the Authority's 12 April 2016 information paper *Assessment of real-time pricing options* available at: http://www.ea.govt.nz/dmsdocument/20599.

4 Technical Code B of Schedule 8.3 of the Code requires the system operator to issue a notice to all participants if:

a) an event listed in clause 5(1) of Technical Code B (event) occurs; or

b) the system operator issues, amends, or revokes an island wide instruction to disconnect demand under clause 5(1A) of Technical Code B.

3.2 The Authority has decided that this amendment will improve the current arrangements. This is particularly because the amendment will give participants certainty that the scarcity pricing regime will apply to all trading periods during which a scarcity pricing event was in effect at the start of the relevant trading period(s). This ensures that the regime will not retrospectively:

(a) change the conditions that apply at the start of a trading period, which impact on final prices

(b) affect the decisions that participants make on the information available at the start of a trading period.

Refinement to the proposed amendment the Authority consulted on

3.3 NZX submitted that there was no need to clarify the trading period(s) to which a notice under clause 13.144(1) relating to an infeasibility, metering or high spring washer price situation applied. This is because, unlike the case of a shortage situation, there is no uncertainty in the Code as to which trading period(s) an infeasibility, metering or high spring washer price situation affects.[5] NZX therefore recommended that clause 13.144(1A) only apply to a notice under 13.144(1) that relates to a shortage situation.

3.4 The Authority agrees with this analysis and has decided to refine the proposed amendment in line with NZX's recommendation. This refinement is consistent with the Authority's policy intent for the amendment proposed in the consultation paper, which is to clarify the trading periods to which a shortage situation applies. The Authority has also simplified the wording of new clause 13.144(1A) to make it clearer.

3.5 The Authority considers that making this refinement to the proposed amendment for Issue 1 will not change the Authority's overall position on the amendments summarised at paragraph 1.11 above. This is because the amendment will still achieve the policy intent in the consultation paper, but will no longer add unnecessary requirements for notices relating to infeasibility, metering or high spring washer price situations.

Proposed amendment for Issue 2

3.6 The Authority has decided to proceed with the proposed amendment to clause 13.144, with the addition of three refinements as outlined at paragraphs 3.13–3.23. The amendment the Authority proposed provided that, if a shortage situation exists at the same time as an infeasibility, metering or SCADA situation:

(a) the 0900 deadline (on the date the pricing manager receives notice of a shortage situation, or input information that yields an infeasibility, metering or SCADA situation) for publishing notice of the shortage situation does not apply

(b) the pricing manager must publish notice of the shortage situation as soon as possible after the pricing manager resolves the infeasibility, metering or SCADA situation.

3.7 The Authority's view is that making the amendment (with the three refinements below) will improve the current arrangements because it will ensure that if a shortage situation

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5 This is because:

a) while a shortage situation might arise part way through a trading period, infeasibility and metering situations concern metered quantities over an entire trading period

b) under the relevant definition in Part 1 of the Code, a 'high spring washer price situation' only exists if a transmission security constraint binds in the relevant trading period(s).

exists at the same time as a provisional price situation, clause 13.144 will allow the pricing manager adequate time to:

(a) first, publish notice of, and resolve, the provisional price situation

(b) subsequently publish notice of the shortage situation.

3.8 In its submission on the consultation paper, Pioneer submitted that the time constraints arising in Issue 2 only occur because clause 13.144 requires the pricing manager to publish notice of a shortage situation after receiving notice of the shortage situation from the system operator under clause 5(1A) of Technical Code B of Schedule 8.3. Pioneer suggested that it would be more appropriate for the system operator (rather than the pricing manager) to publish notice of the shortage situation under clause 13.144, leaving the pricing manager to determine whether a scarcity pricing situation exists.

3.9 The Authority's preference is to keep the obligation to publish notice of the shortage situation on the pricing manager. This is because it is the pricing manager that manages and resolves provisional price situations, and determines whether a scarcity pricing situation exists or not. The Authority therefore considers that the pricing manager is best placed to manage notices for the scarcity pricing regime. In addition to publishing notice of a shortage situation, this includes publishing notice of whether or not the shortage situation gives rise to a scarcity pricing situation under clause 13.135A.

3.10 In its submission on the consultation paper, NZX raised two concerns with the proposed amendment:

(a) the proposed amendment should require the pricing manager to resolve *all* types of provisional price situations (including high spring washer price situations) in a trading period before determining whether a scarcity pricing situation exists in that trading period

(b) the proposed amendment requires the pricing manager to delay publishing a shortage situation notice for a trading period until it has resolved all infeasibility, metering and SCADA situations in that trading period. NZX considered that this delay could cause unnecessary confusion for participants in the context of a serious event.

3.11 As outlined below in paragraph 3.13, the Authority has decided to refine the proposed amendment to address NZX's concern in paragraph (a) above. Regarding the concern NZX raises in paragraph (b) above, the Authority disagrees that a delay in publishing a shortage situation notice (caused by the pricing manager resolving a provisional price situation) would cause unnecessary confusion for participants. This is because at that point, under clause 5(1A) of Technical Code B of Schedule 8.3, the system operator would have already informed all participants in writing that it had issued an instruction to disconnect demand—which under clause 13.144(1) triggers the scarcity pricing regime. Participants would therefore already be on notice that the scarcity pricing regime was in effect.

3.12 The Authority has also included a refinement to address the situation in which the pricing manager cannot resolve a provisional price situation that exists at the same time as a shortage situation.

Refinements to the proposed amendment the Authority consulted on

First refinement – resolving all provisional price situations before publishing a shortage situation notice

3.13 Refining the amendment to address NZX's concern in paragraph 3.10(a) above will ensure the pricing manager resolves all types of provisional price situation in a trading period before:

(a) publishing notice of a shortage situation

(b) determining whether a scarcity pricing situation exists in that trading period.

3.14 This refinement is particularly appropriate given that:

(a) if both a high spring washer price situation and a shortage situation exist in the same trading period, there will not be a scarcity pricing situation in that trading period. This is because for there to be a scarcity pricing situation, clause 13.135C(3)(a) requires that there be no binding constraints (excluding the HVDC link). However, under the definition of 'high spring washer price situation' in Part 1 of the Code, for a high spring washer price situation to exist, one or more transmission security constraints must bind

(b) resolving one provisional price situation that affects a trading period may produce input information that yields another provisional price situation relating to the same trading period. For example, resolving an infeasibility situation may produce input information that yields a metering situation.

3.15 Consequently, requiring the pricing manager to resolve all provisional price situations (including a high spring washer price situation and any subsequent provisional price situation that arises from resolving the original provisional price situation) in a trading period before publishing notice of the shortage situation would:

(a) ensure all provisional price situations are resolved before the pricing manager determines whether a scarcity pricing situation exists

(b) reduce the amount of time between the pricing manager issuing the shortage situation notice and determining whether a scarcity pricing situation exists.

3.16 The Authority considers that making this refinement to the proposed amendment for Issue 2 will not change the Authority's overall position on the amendments summarised at paragraph 1.11 above. Specifically, the benefits of the refinement noted in paragraph 3.15 will increase the operational efficiency and therefore the durability of the scarcity pricing regime.

Second refinement –circuit breaker for when the pricing manager cannot resolve a provisional price situation that exists at the same time as a shortage situation

3.17 The proposal in the consultation paper did not address the scenario in which the pricing manager is unable to resolve a provisional price situation that exists at the same time as a shortage situation. Inability to resolve a provisional price situation in these circumstances would prevent the pricing manager issuing the notice of the shortage situation under new clause 13.144(3)(b)(ii) proposed in the consultation paper. The scarcity pricing regime would consequently come to a halt, which would prevent the pricing manager from determining whether a scarcity pricing situation exists, and prevent delivery of the regime's predicted benefits.

3.18 The Authority has therefore decided to add a 'circuit breaker' to resolve the scenario outlined above as a second refinement to the Authority's proposal for Issue 2. The circuit breaker under new clause 13.144(5) will use the existing process for addressing unresolved provisional price situations under clauses 13.164 and 13.165. Specifically, under clause 13.164(a), if the pricing manager cannot resolve a provisional price situation, it must publish notice that it cannot calculate interim prices and interim reserve prices, specifying the trading period(s) affected. Under clause 13.164(b), the pricing manager must then publish interim prices for the affected trading period(s) by assigning prices for grid injection points using the methodology in clause 13.164(b). The system operator or grid owner then provides details of the unresolved provisional price situation to the Authority under clause 13.165(1). Under clause 13.165(2), the Authority must urgently consider and address the unresolved provisional price situation.

3.19 New clause 13.144(5) provides that if the pricing manager cannot resolve a provisional price situation that exists at the same time as a shortage situation, the pricing manager must publish notice of the shortage situation:

(a) after publishing notice under clause 13.164(a) in relation to the trading period(s) affected by the unresolved provisional price situation; but

(b) before publishing interim prices for the relevant trading period using the process under clause 13.164(b).

3.20 This refinement will remove a potential obstruction to the smooth operation of the scarcity pricing regime, and is consistent with the policy intent in the consultation paper of ensuring all provisional price situations that would otherwise frustrate the regime are addressed. This in turn is consistent with the Authority's overall position on the amendments summarised at paragraph 1.11 above.

Third refinement – notifying participants if the pricing manager determines under clause 13.135A that a scarcity pricing situation does not exist

3.21 The third refinement the Authority has made to the proposed amendment is to include as a new clause 13.135A(6), a requirement that if the pricing manager determines under clause 13.135A that a scarcity pricing situation does <u>not</u> exist, the pricing manager must publish notice of its determination.

3.22 This added requirement reflects the discussion above at paragraphs 3.14 and 3.15 that after resolving a provisional price situation (existing in the same trading period(s) as a shortage situation), the pricing manager may determine that no scarcity pricing situation exists in that trading period. In such circumstances, the pricing manager will have already published notice of the shortage situation, putting participants on notice of the impending decision on whether a scarcity pricing situation exists. It would therefore be appropriate for the pricing manager to subsequently notify participants of its determination under clause 13.135A that no scarcity pricing situation exists. Doing so would provide an appropriate end point to the scarcity pricing regime, and provide certainty to participants regarding the prices that will apply in the relevant trading periods.

3.23 As with the first and second refinements, the Authority considers that making this refinement to the proposed amendment for Issue 2 will not change the overall position summarised at paragraph 1.11 above. The refinement adds certainty and ties off a 'loose end' in the scarcity pricing regime, which may allow for a more efficient transition to business as usual for participants.

Proposed amendment for Issue 3

3.24 The Authority has decided to proceed with the proposed amendment to clause 13.135A, with two added refinements as outlined below at paragraph 3.27. The proposal the Authority consulted on would have required the pricing manager to resolve all provisional price situations for the 336 trading periods preceding the relevant trading period, before determining whether a scarcity pricing situation exists.

3.25 NZX suggested that a more preferable alternative to the proposed amendment would be to allow the pricing manager to calculate the average island GWAP under clause 13.135C using provisional prices, and to publish the resulting scarcity prices as provisional. NZX considered that participants would rather see some form of pricing information in a scarcity pricing situation (even if it is provisional) rather than none at all.

3.26 The Authority disagrees with this view on the basis of the analysis in paragraphs 3.14 and 3.15 above. That is, if the pricing manager resolves all provisional price situations in the relevant trading period[6] and the 336 trading periods preceding it,[7] it may be that under clause 13.135A, there is no scarcity pricing situation. In such circumstances, publishing provisional pricing information before determining whether a scarcity pricing situation existed would be premature, and would potentially confuse participants with contradictory messages as to whether a scarcity pricing situation existed.

Refinements to the proposed amendment the Authority consulted on

3.27 The Authority has refined its proposal for clause 13.135A(2A) by:

(a) changing the wording in paragraph (a) from "resolved any provisional price situation that existed in any of the 336 trading periods before the relevant trading period" to "calculated interim prices for the 336 trading periods before the relevant trading period"

(b) clarifying the wording of paragraph (b) where an infeasibility situation caused by a shortage of instantaneous reserve existed in the 336 trading periods before the shortage situation.

3.28 The refinement to clause 13.135(2A)(a) provides for the scenario described in paragraph 3.17, in which the pricing manager is unable to resolve a provisional price situation existing in one of the 336 preceding trading periods. Requiring the pricing manager to calculate interim prices will ensure all provisional price situations are either resolved, or dealt with under clauses 13.164 and 13.165, before the pricing manager determines whether a scarcity pricing situation exists.

3.29 The refinement to clause 13.135(2A)(b) ensures that an infeasibility situation caused by a shortage of instantaneous reserve that arose in one of the 336 preceding trading periods is dealt with either under clause 13.166A, or if the pricing manager cannot resolve the infeasibility situation, under clauses 13.164 and 13.165. The refinement clarifies the wording and intention of clause 13.135(2A)(b), and ensures the pricing manager deals with such infeasibility situations in the manner described above, before determining whether a scarcity pricing situation exists.

3.30 The Authority considers that the two refinements are consistent with the Authority's overall position on the amendments summarised at paragraph 1.11 above. Specifically, the refinements do not alter the consultation paper's policy intent of dealing with provisional price situations that would otherwise affect the scarcity pricing regime, and are not material changes to the proposals the Authority consulted on.

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6 Under new clause 13.144(4), before publishing notice of the shortage situation.

7 Under new clause 13.135A(2A), after publishing notice of the shortage situation.

Proposed amendment for Issue 4

3.31 The Authority has decided to proceed with the proposed amendment to clause 13.135B, with the addition of two refinements arising from recommendations NZX made in its submission, as outlined at paragraphs 3.32–3.36 below. The proposed amendment addresses the situation in which interim prices change after the pricing manager has calculated and published them under clause 13.135B(1). If this occurs, new clause 13.135B(2) will require the pricing manager to recalculate the interim prices for the relevant trading period using the scarcity pricing methodology under Schedule 13.3A, and republish them.

Refinements to the proposed amendment the Authority consulted on

First refinement – recalculating and republishing scarcity prices if interim prices for one of the 336 preceding trading periods change due to an upheld pricing error claim

3.32 NZX submitted that the proposed amendment to clause 13.135B would not accommodate a change to interim prices for one of the 336 trading periods (preceding the trading periods affected by the scarcity pricing situation) arising from a pricing error claim the Authority upheld under clause 13.175.

3.33 The Authority has refined the proposed amendment to address this situation. This refinement helps achieve the Authority's policy intent for the amendment, as outlined in the consultation paper. Specifically, if, after the pricing manager has calculated and published interim prices under clause 13.135B, interim prices for any of the 336 trading periods preceding the relevant trading period change, this would change the island GWAP calculated under Schedule 13.3A. This in turn would make the interim prices published under clause 13.135B incorrect, and could change whether the limitations under clause 13.135C on the scarcity pricing regime apply.

3.34 If interim prices change in such circumstances, the Code should require the pricing manager to recalculate and republish the interim prices for the relevant trading period using the scarcity pricing methodology under Schedule 13.3A. The Authority considers that the refinement to the proposed amendment achieves this, and is therefore consistent with the overall position summarised at paragraph 1.11 above.

Second refinement – change in wording of clause 13.135B(2)(b) for consistency with first refinement

3.35 NZX also recommended a change to the wording of the proposed new clause 13.135B(2)(b). The recommended change provides for the fact that, as outlined above in relation to the first refinement, interim prices might change for reasons other than because the pricing manager resolves a provisional price situation.

3.36 For the reasons outlined above at paragraphs 3.33 and 3.34, the Authority agrees with this analysis and has revised the wording of new clause 13.135B(2)(b) accordingly.

Proposed amendment for Issue 5

3.37 The Authority has decided to proceed with the proposed amendment to revise the deadline under clause 13.135B(1)(b)(ii) from 2.5 hours to 4 hours. The Authority considers that the revised deadline will provide enough time for the pricing manager to calculate and publish interim prices under clause 13.135B(1)(b)(ii), but will not unduly delay the operation of the scarcity pricing regime.

Proposed amendment for Issue 6

3.38 The Authority has decided to amend the typographical error in clause 1(2) of Schedule 13.3A, which sets out a formula that the pricing manager must use to calculate the island GWAP in a scarcity pricing situation. The formula incorrectly uses the interim price at the node at which the relevant generator injects electricity in the island. This is incorrect because after calculating GWAP, clause 2(1) of Schedule 13.3A requires the pricing manager to calculate interim prices using GWAP.

3.39 The Authority's view is that replacing the reference to "interim price" in the formula with "initial interim price" (which is the correct reference used in related clauses 1(1) and 2(1) of Schedule 13.3A) will resolve this issue.

4 The Authority will address several of the other points submitters raised in its real-time pricing work

4.1 Meridian, Pioneer and MEUG questioned whether the Authority's proposed amendments for Issues 4 and 5 were consistent with its focus on RTP.[8] However, MEUG preferred the proposed amendments over waiting for an alternative solution from the Authority's RTP work. This is because MEUG considered RTP would take at least three years to implement and a scarcity pricing event could occur in the interim.

4.2 The Authority acknowledges that the amendments for Issues 4 and 5 would be unlikely to align with a proposal to move to RTP. However, the amendments are consistent with the existing scarcity pricing regime (which takes an ex-post approach to pricing) and are necessary to make the regime work. The Authority is still in the early stages of exploring a move to adopt RTP, and aims to consult on an RTP proposal, including Code amendments, in mid-2017. The Authority expects to revisit and review the pricing approach for the scarcity pricing regime during the development of that RTP proposal.

4.3 Contact noted that in the case of emergency load shedding situations, its preference was that scarcity prices be based on a fixed figure rather than a range of figures. Contact did not believe that basing scarcity prices on the cost of last-resort generation (rather than the value of lost load) was consistent with the assumption that load shedding must occur to trigger scarcity pricing. This is also an issue the Authority is considering as part of its RTP work.

4.4 Contact also considered that enabling generators to reduce offer prices within the two hour gate closure window would:

(a) provide a better indication of the true balance between demand and supply

(b) avoid artificially limiting available generation when the market unexpectedly becomes stressed.

4.5 The Authority has worked closely with MOSPs and other stakeholders and has decided to amend the Code to reduce the duration of the gate closure window to one hour, which the Authority considers will achieve the outcomes sought in Contact's proposal.[9] MOSPs will still need to carry out the detailed design of the changes necessary to their market

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8 See above at n3.

9 *Decision Paper - Shortened gate closure and revised bid and offer provisions*, http://www.ea.govt.nz/development/work-programme/pricing-cost-allocation/bid-and-offer-provisions-of-the-code/development/decisions-and-reasons-paper-published/.

systems. The Authority anticipates that the Code amendments to the gate closure window will come into force at the end of June 2017.

5 The Authority has published a flowchart to assist understanding of the scarcity pricing regime

5.1 Mercury supported the intent of the proposed amendments to correct and clarify aspects of the scarcity pricing regime, but expressed concern that the mechanics of the regime remained complex and opaque. Mercury considered the factors and process that gave rise to scarcity pricing to be particularly complex, including the fact that the pricing manager determined scarcity pricing ex-post. Pioneer encouraged the Authority to focus on simplifying the regulatory arrangements for the industry. Pioneer considered that complexity in the industry creates confusion and distrust from consumers and represents a significant barrier to new entrants and innovation in the industry.

5.2 These concerns are understandable because the scarcity pricing regime applies retrospectively, but is subject to several uncertain variables (for example, dealing with provisional price situations).

5.3 To assist participants’ understanding of the process that the regime follows, the Authority has prepared and published a detailed flowchart showing each step in the process. While such a flowchart might not resolve all aspects of the concerns raised above, it illustrates the different outcomes that the regime might produce (depending on the relevant circumstances), and the relevant Code provisions that underpin each outcome.

Appendix A Draft strikethrough version of scarcity pricing Code amendments

A.1 The drafting for the scarcity pricing Code amendments is set out below.

A.2 The drafting that is in black strike-through or black underline shows the changes the Code amendments will make to the Code that the Authority proposed in the consultation paper and has decided to adopt. The drafting that is in red shows the refinements the Authority adopted and incorporated into the Code amendments after considering submissions on the consultation paper.

Technical Code B of Schedule 8.3

5 Formal notices and responses

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(2) The **system operator** must ensure that a **formal notice** issued in accordance with subclause (1) or subclause (1A) includes the following:

(a) the electrical or geographical region affected by the notice:

(b) the potential consequences of the situation:

(c) the responses requested of **participants**:

(d) the start time and end time of the situation ~~**trading periods**~~ to which the notice applies.

——

13.135A Notice of scarcity pricing situation

…

(2A) The **pricing manager** must determine whether a **scarcity pricing situation** exists in the relevant **trading period** only after the **pricing manager** has—

(a) ~~resolved any **provisional price situation** that existed in any of~~calculated **interim prices** for the 336 **trading periods** before the relevant **trading period**; and

(b) ~~under clause 13.166A, recalculated and **published interim prices** for the relevant **trading period** by adding a virtual provider of **fast instantaneous reserve** and **sustained instantaneous reserve**~~if an **infeasibility situation** caused by a shortage of **instantaneous reserve** existed in any of the 336 **trading periods** before the relevant **trading period**, either—

(i) recalculated **interim prices** for that **trading period** in accordance with clause 13.166A; or

(ii) calculated **interim prices** for that **trading period** in accordance with clause 13.164(b).

…

(6) If the **pricing manager** determines that a **scarcity pricing situation** does not exist, the **pricing manager** must **publish** notice of its determination.

——

13.135B Methodology to prepare interim prices and interim reserve prices if scarcity pricing situation exists

(1) Subject to clause 13.135C, if a **scarcity pricing situation** exists in a **trading period**, the **pricing manager** must—

(a) calculate **interim prices** and **interim reserve prices** in the affected **island** or **islands** for that **trading period** in accordance with the methodology set out in Schedule 13.3A; and

(b) **publish interim prices** and **interim reserve prices** for the **trading period** by—

(i) if no **provisional price situation** is notified, 1200 hours in the following **trading day**; or

(ii) if a **provisional price situation** is notified, ~~2.5~~4 hours after the **provisional price situation** is resolved.~~; and~~

(2) Despite subclause (1), subclause (3) applies if a **scarcity pricing situation** exists in a **trading period**, and there is a change to~~—~~

(a) **interim prices** or **interim reserve prices** calculated and **published** under subclause (1)~~(a) and (1)(b)(i)~~ for the **trading period**; or

(b) **interim prices** or **interim reserve prices published** for any of the 336 **trading periods** before the **trading period**.

(3) If this subclause applies, the **pricing manager** must—

(a) recalculate **interim prices** and **interim reserve prices** in the affected **island** or **islands** for ~~that~~the **trading period** in which the **scarcity pricing situation** exists, in accordance with the methodology set out in Schedule 13.3A; and

(b) **publish** the recalculated **interim prices** and **interim reserve prices** ~~for the **trading period**~~ no later than 4 hours after the change to **interim prices** or **interim reserve prices**~~the **provisional price situation** is resolved~~.

13.144 Pricing manager to give notice of infeasibility situation, metering situation, high spring washer price situation, or shortage situation

(1) Subject to subclause (2), if the **pricing manager** receives **input information** that yields an **infeasibility situation**, or a **metering situation**, or a **high spring washer price situation**, or receives notice of a **shortage situation** in accordance with clause 5(1A) of **Technical Code** B of Schedule 8.3, the **pricing manager** must~~, no later than 0900 hours on the day that the **pricing manager** receives the **input information** or notice,~~—

(a) **publish** notice of the **infeasibility situation**, or **metering situation**, or **high spring washer price situation**, or **shortage situation**; and

(b) specify in the notice each **trading period** affected by the **infeasibility situation**, or **metering situation**, or **high spring washer price situation**, or **shortage situation**; and

(c) in relation to each **trading period** affected by a **high spring washer price situation**, specify in the notice each **transmission security constraint** that has **bound** in the relevant **trading period** or **trading periods**; and

(d) in relation to each **trading period** affected by a **shortage situation**, specify in the notice whether the **shortage situation** is an **island shortage situation** or a **national shortage situation**.

(1A) For the purposes of subclauses (1)(b) and (1)(d), a **trading period** affected by a **shortage situation** is a **trading period** in respect of which a~~the **pricing manager** must only specify in the notice under subclause (1)(a) relating to a **shortage situation**, those **trading periods** in respect of which the **infeasibility situation**, or **metering situation**, or **high spring washer price situation**, or~~ **shortage situation** was in effect at the start of the relevant **trading period**.

(2) The **pricing manager** must not give notice of a **high spring washer price situation** or **shortage situation** in accordance with subclause (1) in relation to a **trading period** if an **infeasibility situation**, or a **metering situation**, or a **SCADA situation** exists in that **trading period** and has not been resolved.

(3) Subject to subclause (4), ~~T~~the **pricing manager** must **publish** notice of ~~the~~an **infeasibility situation**, **metering situation**, **high spring washer price situation**, or **shortage situation** under subclause (1)(a)~~— (a)~~ no later than 0900 hours on the day that the **pricing manager** receives the relevant **input information** or notice.~~; or~~

(4) ~~(b) i~~If a **shortage situation** exists at the same time as a~~n **infeasibility situation**, a **metering situation**, or a **SCADA**~~ **provisional price situation**, the **pricing manager** must **publish** notice~~—~~

~~(i) of the **infeasibility situation**, a **metering situation**, or a **SCADA provisional price situation**, no later than 0900 hours on the day that the **pricing manager** receives the relevant **input information** or notice; and~~

~~(ii)~~ of the **shortage situation** as soon as possible after the **pricing manager** resolves~~—~~

(~~A~~a) the ~~**infeasibility situation**, a **metering situation**, or a **SCADA**~~ **provisional price situation**; and

(~~B~~b) any subsequent **provisional price situation** that arises from resolving the **provisional price situation**.

(5) Despite subclause (4), if the **pricing manager** cannot resolve a **provisional price situation** that exists at the same time as a **shortage situation**, the **pricing manager** must **publish** notice of the **shortage situation**—

(a) after the **pricing manager** has **published** notice under clause 13.164(a) in relation to the **trading periods** affected by the unresolved **provisional price situation**; but

(b) before the **pricing manager publishes interim prices** under clause 13.164(b) for each **trading period** affected by the unresolved **provisional price situation**.

Schedule 13.3A Calculation of interim prices and interim reserve prices in scarcity pricing situation

1 Calculation of interim prices and interim reserve prices in island scarcity pricing situation

...

P_g is the initial **interim price** at the **node** where **generator** g injects **electricity** in the **island**

…

2 Calculation of interim prices in national scarcity pricing situation

…

P_g is the initial **interim price** at the **node** where **generator** g injects **electricity** in both **islands**

…

Glossary of abbreviations and terms

Act	Electricity Industry Act 2010
Authority	Electricity Authority
Code	Electricity Industry Participation Code 2010
GWAP	generation weighted average spot price
MOSP	Market operation service provider
original scarcity pricing amendment	Electricity Industry Participation (Scarcity Pricing) Code Amendment 2011
RTP	real-time pricing