

# Clarify the availability and use of discretionary demand control

Decision paper

May 2023

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## Executive Summary

The Electricity Authority (Authority) has decided to amend the Electricity Industry Participation Code (Code) to implement Option E: Clarify availability and use of 'discretionary demand' control (such as ripple control). To ensure implementation in time for winter 2023, these amendments are being made as an urgent Code amendment under section 40 of the Electricity Industry Action 2010.

From 25 November to 16 December 2022, the Authority consulted on 11 options to better manage risks to electricity supply during peak demand periods in winter 2023. The options seek to improve market information and incentives, consistent with the Authority's statutory objectives. The Authority has previously decided to implement three other options (A, B, and D). The decision to implement Option A (Provide better information headroom in supply stack) was described in the decision paper – *Driving efficient solutions to promote consumer interests through winter 2023*<sup>1</sup>. The decisions to implement Option B (Provide forecast spot prices under demand sensitivity cases) and Option D (System operator review of wind offers based on external forecast) were published on our website in early April<sup>2</sup>.

This paper explains the Authority's decision to implement one of these options, Option E, in preparation for winter 2023 and the potentially challenging situations that may lead to strains in New Zealand's electricity system.

The use of discretionary demand control under a grid emergency<sup>3</sup> is a key tool for the system operator in maintaining power system security. The Hodgson<sup>4</sup> report into the electricity supply interruptions of 9 August 2021 also recommended an increase in the visibility of discretionary demand control to the system operator to improve their ability to maintain system security under a grid emergency.

However, it is not a 'free' resource and should only be employed when normal market resources have not been committed in sufficient quantity.

Under current arrangements, availability and use of discretionary demand control is invisible to other participants, making resource commitment decisions difficult. When discretionary demand control is called upon, the wholesale price is suppressed, removing the price signal for more efficient resources to be employed.

The confirmed design for Option E will provide an additional information gathering method to the system operator to maintain system security while providing enhanced information and incentives to market participants.

Distributors will use difference bids priced at a scarcity-like price (\$9,000/MWh) to signal the availability of discretionary demand control when requested by the system operator. The effect of difference bids will be visible to participants in the forward schedules (up to 36 hours ahead), so participants can clearly see when they are likely to be called upon and

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<sup>1</sup> See: [Driving-efficient-solutions-to-promote-consumer-interests-through-winter-2023-\\_D28umrs.pdf](#) (ea.govt.nz)

<sup>2</sup> See: [Decision to implement Options B and D | Electricity Authority](#) (ea.govt.nz)

<sup>3</sup> Grid emergencies are a part of the system operator's power system security management process.

<sup>4</sup> <https://www.mbie.govt.nz/dmsdocument/17988-investigation-into-electricity-supply-interruptions-of-9-august-2021>

the price impact of that action. Scarcity prices will be reflected in final prices if discretionary demand control is required by the system operator.

This will improve information for participants as there will be better alignment between the forward schedules and real time, meaning participants will have better information at the time they are making a decision to commit their resource.

Furthermore, the work will act as an enabler for future market participation of discretionary demand. This includes improved incentives on spot-exposed participants, such as retailers, to contract for discretionary demand control to be offered as demand response at prices lower than scarcity prices.

It is acknowledged that difference bids may not be an efficient method of communication for all distributors, so the solution allows for some distributors to continue with the current operational practice of supplying a verbal estimate of available discretionary demand control. The system operator will work with distributors to agree a method for communicating their level of available discretionary demand by 31 May 2023, noting that the system operator's preferred method is the use of difference bids.

## **Next Steps**

Following publication of this decision, the Authority will continue to work with the system operator, NZX and distributors to implement this option. Distributors will also have the opportunity to test the new operational processes being introduced by Option E at the upcoming industry simulation exercise planned for 24 and 31 May 2023.

The urgent Code amendment will come into effect for nine months from 3 May 2023.

Following winter 2023, the Authority will consider whether a permanent Code amendment is appropriate for winter 2024 and beyond. If the Authority considers it is worth exploring a permanent Code amendment, a full consultation process on the proposed amendment will follow.

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# 1. Background and Purpose

- 1.1. On 25 November 2022, the Authority prepared and published its *Driving efficient solutions to promote consumer interests through winter 2023* consultation paper, acting on information from the system operator concerning potential risks around peak capacity during times of constrained generation and high demand in winter 2023. The consultation period closed on 16 December 2022.
- 1.2. Following consultation feedback and technical work by the system operator, the Authority published its *Driving efficient solutions to promote consumer interests through winter 2023* decision paper. This paper explains the Authority's decisions to implement or further progress the development of five options for potential implementation as follows:
  - Implement Option A: Provide better information on headroom in supply stack.
  - Progress Option B: Provide better forecast spot prices under demand sensitivity cases.
  - Progress Option D: System Operator review of wind offers based on external forecast.
  - Progress Option E: Clarify availability and use of 'discretionary demand' control (such as ripple control).
  - Progress Option G: Selectively increase existing ancillary service cover at times to offset increased uncertainty in net demand.
- 1.3. The paper confirmed the Authority's decision to implement Option A by winter 2023. The Authority has continued to work through the design of options B, D, E and G with the system operator. The work has focussed on refining the design of each option to deliver the desired benefits to consumers while ensuring the option can be implemented in time for winter 2023.
- 1.4. The Authority published its decision<sup>5</sup> to implement Options B and D on 13 April 2023.
- 1.5. The purpose of this follow-up paper is to confirm the Authority's decision to implement Option E.
- 1.6. This paper:
  - (a) Provides the background on Option E including a recap of the consultation and previous decision to progress Option E.
  - (b) Provides an overview of the final design and associated Code amendment.
  - (c) Explains the Authority's decision to implement Option E.
  - (d) Explains the next steps the Authority intends to take following the release of this paper.

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<sup>5</sup> <https://www.ea.govt.nz/projects/projects/decision-to-implement-options-b-and-d/>

## 2. Background to the Authority's decision to progress Option E

### What MBIE said in its investigation into 9 August 2021 electricity supply interruptions

- 2.1. The Hodgson report into the electricity supply interruptions of 9 August 2021 recommended an increase in the visibility of discretionary demand control. The specific recommendation related to the provision of real-time information on demand management resource availability to the system operator<sup>6</sup>.

### What the Authority said in its consultation paper

- 2.2. There is currently poor information available on the level of discretionary demand that network companies can readily curtail if called upon to do so. There is also some uncertainty about who has the right to curtail this load and in what circumstances. In particular, there is uncertainty about when the system operator would call upon network companies to reduce demand.
- 2.3. When this has occurred in the past, it usually happens close to real time, which does not help with demand forecasting during the time period needed for resource commitment decisions.
- 2.4. Option E would require distributors with discretionary demand control to indicate the availability of their discretionary demand via wholesale market mechanisms when the system operator issues a Customer Advice Notice (CAN) advising of a potential low residual situation. This would provide greater visibility on the expected quantity of discretionary demand control in forward schedules, which could assist participants with short-term contracting and commitment decisions.

### The Authority's response and decision

- 2.5. As part of the 9 March 2023 decision paper, the Authority decided to progress development of this option for the following reasons:
  - (a) Price signals become more certain by providing information on the extent and impact of discretionary demand management. Price signals are strengthened by assigning a scarcity-like price to discretionary demand that would otherwise respond 'for free' should the system operator require it in a grid emergency. These factors facilitate greater competition and allow the market to discover a more efficient level of reliability.
  - (b) In addition, by acting as an enabler for future use of discretionary demand in the spot market, this option would deliver long-term efficiency benefits.
  - (c) With these benefits and a relatively minimal cost to implement and manageable risks of unintended consequences, we are confident this option is for the long-term benefit of consumers.
- 2.6. The decision paper also described that an initial assessment by the system operator indicated this option could be implemented by winter 2023 with some further investigation and development work required.

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<sup>6</sup> [Hodgson report](#), recommendation #6.

### 3. Development and design of Option E

- 3.1. Following the Authority's decision to further progress this option, the Authority has worked with the system operator and the wholesale information trading system (WITS) manager to confirm the design details for this option.
- 3.2. Initial thoughts included the use of the new dispatch notification product to signal availability of discretionary demand control. However, the complexity of using a new product and implementation requirements ruled out this approach as impractical before winter 2023.
- 3.3. A key consideration in designing the new process was to minimise the changes to existing grid emergency processes. This would reduce operational change overhead and the risk of error or misunderstanding under a grid emergency situation.
- 3.4. The confirmed design for Option E introduces a new method for signalling discretionary demand management availability. To ensure the solution can be implemented in time, the approach involves:
  - (a) Using difference bids to signal the availability of discretionary demand control – difference bids have been a feature of the wholesale market since 2012 but have not been actively used by participants. These bids allow participants to signal the price sensitivity of load in the forecast market schedules but are not used in the calculation of dispatch prices.
  - (b) Providing Transpower with the discretion to target the larger distributors instead of requiring all distributors to bid.
- 3.5. Distributors must agree with the system operator a method for communicating their level of available discretionary demand. The preferred method is via difference bids, as this would provide greater visibility of the expected quantity of discretionary demand control in forward schedules, which could assist participants with short-term contracting and commitment decisions.
- 3.6. It is acknowledged that difference bids may not be an efficient method of communication for all distributors, so the solution allows for some distributors to continue with the current operational practice of supplying a verbal estimate of available discretionary demand control.
- 3.7. The discretionary demand control that is intended to be signalled through this option would only be that which would be available for the system operator to call for under a grid emergency. This is consistent with the current operational practice, thus reducing the risk of operational confusion during a grid emergency.
- 3.8. To maintain consistency with current operational practice, the emergency discretionary demand being signalled through this mechanism would exclude:
  - (a) Any discretionary demand offered as interruptible load in the instantaneous reserve market. This ensures that power system security is not compromised further through the loss of instantaneous reserve provision.
  - (b) Any discretionary demand the distributor is already intending to use for its own network management purposes. Any demand control that the distributor would routinely undertake under normal operations is already likely to be accounted for in the system operator's load forecast or may already be used ahead of the grid emergency situation.
  - (c) Any discretionary demand that the distributor has contracted with a third party, for example a retailer, to bid as dispatchable demand or dispatch notification

load into the wholesale market. This exclusion ensures that the provision of emergency demand control provides an incentive for third parties exposed to high spot prices to contract with distributors to bid demand flexibility into the wholesale market under normal operational circumstances.

- 3.9. A difference bid would only need to be provided when requested by the system operator. This request is likely to be in the form of a Customer Advice Notice (CAN) but could also be requested via other mechanisms or notices such as a Warning Notice (WRN) or a Grid Emergency Notice (GEN).
- 3.10. The quantities in the bids would need to be updated as estimates of the quantity of available discretionary demand control change in the lead up to the notified grid emergency period. The discretionary demand control must be priced at \$9,000/MWh in the difference bid. This price was chosen to provide a strong scarcity-like price signal in the forecast market schedules.
- 3.11. The effect of difference bids can be seen in the Price-Responsive Schedules (PRS) so participants can clearly see when they are likely to be called upon and the price impact of that action. Both the price and total MW volume of difference bids would be visible to participants in the PRS.
- 3.12. Difference bids are only used in the PRS, they are not used in the dispatch schedule. Should the system operator require distributors to reduce their discretionary demand under a grid emergency, the system operator will use the existing real time dispatch pricing functionality to add back discretionary demand they have instructed to be reduced. This will result in final prices reflecting the scarcity situation that the power system is in (\$10,000/MWh) and the potential value in providing further resources to avoid discretionary demand management.
- 3.13. The use of a scarcity-like price for discretionary demand control will provide three benefits to the wholesale market:
  - (a) Incentives on participants to make resource available or to contract to make resource available are improved, as discretionary demand is priced rather than being provided 'for free' and suppressing market prices when called on, as has been the case in the past.
  - (b) Information for participants is improved, not only because they will have more information on the quantity of discretionary demand, but there will be better alignment between the forward schedules (with scarcity-like prices if the bid discretionary demand is required) and real time (with scarcity prices if discretionary demand is required), meaning participants will have better information at the time they are making decisions to commit their resource.
  - (c) This work will act as an enabler for future market participation of discretionary demand as distributors will have experience bidding their resource and prospective contracting counter-parties will have better visibility of the amount of discretionary demand available. Spot-exposed participants, such as retailers, will be incentivised to contract for discretionary demand control to be offered as demand response at prices lower than scarcity prices.
- 3.14. The Authority and the system operator have agreed that the system operator will determine which distributors are required to submit difference bids. The system operator will prioritise distributor implementation by considering which they should target to gain the maximum benefit for winter 2023.
- 3.15. Some distributors are already registered traders in WITS and minor changes will be required to their trader account to allow them to submit difference bids. Those who



are not already registered traders may be able to agree with another distributor to submit difference bids on their behalf.

## 4. The Authority has decided to implement Option E

- 4.1. The system operator has expressed concern regarding potential risks around peak capacity during times of limited generation and high demand in winter 2023. In its Security of Supply Assessment (SOSA)<sup>7</sup> published in June 2022, the system operator suggested that under certain scenarios the winter capacity margin could fall under the security standard set out in the Code as early as 2024.
- 4.2. The system operator subsequently undertook further analysis and issued its Market insights report – winter review November 2022<sup>8</sup>. That report sets out system operator concerns that tight peak supply conditions may be more prevalent in winter 2023 than indicated in its June 2022 Security of Supply Assessment.
- 4.3. The Authority considers that the approach for Option E will achieve the objective of clarifying the status of discretionary demand and improving price signals to market participants while also being implementable by winter 2023.
- 4.4. Amendments to the Electricity Industry Participation Code (Code) are required to implement Option E. To ensure implementation in time for winter 2023, these amendments are being made as an urgent Code amendment under section 40 of the Electricity Industry Act 2010; such amendments are temporary (i.e. they last nine months) and do not require consultation.
- 4.5. The Authority considers that it is desirable in the public interest to implement this Code amendment urgently because it will address the potential risks highlighted by the system operator and promote the reliable supply of electricity to consumers for winter 2023, noting that consultation is not possible on these amendments prior to winter 2023.
- 4.6. Following winter 2023 the Authority will consider and recommend whether a permanent Code amendment is appropriate for winter 2024 and beyond.
- 4.7. The Code amendment provides that:
  - (a) The system operator and distributors agree a method of signalling their discretionary demand control, with the default method being by difference bids.<sup>9</sup>
  - (b) Distributors required to bid their discretionary demand will submit this information in the form of a difference bid at a scarcity-like price (e.g. \$9,000/MWh to provide a strong scarcity-like price signal in the forecast schedules). Distributors not required to provide difference bids will continue to use existing communication methods (such as phone) to notify the system operator of their available discretionary demand. This information will only be required to be submitted for any impacted trading periods following a request from the system operator.

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<sup>7</sup> <https://www.transpower.co.nz/system-operator/planning-future/security-supply-annual-assessment>

<sup>8</sup> [https://tpow-corp-production.s3.ap-southeast-2.amazonaws.com/public/bulk-upload/documents/Market%20insight%20report%20-%20Winter%20Review%20-%2011%20Nov%202022.pdf?VersionId=QaQVHc8zmQ6\\_FpC\\_Ux7GOimodObF9Vt2](https://tpow-corp-production.s3.ap-southeast-2.amazonaws.com/public/bulk-upload/documents/Market%20insight%20report%20-%20Winter%20Review%20-%2011%20Nov%202022.pdf?VersionId=QaQVHc8zmQ6_FpC_Ux7GOimodObF9Vt2)

<sup>9</sup> This provides the system operator the flexibility to require those distributors with significant discretionary demand resources to be targeted first while not requiring distributors with little or no resource to implement changes that would have no additional benefit.

- (c) Distributors must have an agreed method in place with the system operator by 31 May 2023.

## 5. Next Steps

- 5.1. The Authority will continue working with the system operator, NZX and distributors to implement Option E.
- 5.2. The urgent Code amendment will come into effect for nine months from 3 May 2023.
- 5.3. The Authority encourages distributors to contact the system operator at [market.operations@transpower.co.nz](mailto:market.operations@transpower.co.nz). The system operator will manage the process with distributors to:
  - (a) Agree a communication method by 31 May 2023.
  - (b) Advise the preferred GXP(s) for difference bids to be submitted at (if required).
  - (c) Liaise with the Authority to arrange access to WITS (if required).
  - (d) Liaise with NZX to manage the set up in WITS (if required).
- 5.4. The Authority and the system operator are running a simulation exercise to test the industry's response to a situation where available supply is insufficient to meet winter peak demand.
- 5.5. The first part of this exercise will be led by the system operator and is scheduled for 24 May 2023. The exercise will include the need to call on discretionary demand control, and will provide distributors with the opportunity to practice the new operational processes and that are being implemented as part of Option E.
- 5.6. The second part of the exercise will be led by the Authority and is scheduled for 31 May 2023. The exercise will focus on testing communications and interactions between distributors and retailers to ensure all parties are well rehearsed in their respective roles. The Authority encourages distributors to register for both sessions.
- 5.7. Longer term, the Authority will assess the value provided by Option E during winter 2023 and assess how to further promote the use of demand response.

## 6. Attachments

- 6.1. The following appendix is attached to this paper:

### **APPENDIX A APPROVED CODE AMENDMENT**

Appendix A      Approved Code Amendment