Proposal to alter the way availability costs are allocated

Consultation paper

Submissions close: 5pm 26 April 2016

8 March 2016

Market Design

1 What you need to know to make a submission

1.1 What this consultation paper is about

1.1.1 The Electricity Authority (Authority) is proposing an amendment to the Electricity Industry Participation Code 2010 (Code) to allocate the costs of procuring instantaneous reserve nationally once a national instantaneous reserve market is implemented. The proposed amendment is attached as Appendix A.

1.1.2 The purpose of this paper is to consult with participants and persons that the Authority thinks are representative of the interests of those likely to be affected by the proposed amendment.

1.1.3 Section 39(1)(c) of the Electricity Industry Act 2010 (Act) requires the Authority to consult on any proposed amendment to the Code and the regulatory statement. Section 39(2) provides that the regulatory statement must include a statement of the objectives of the proposed amendment, an evaluation of the costs and benefits of the proposed amendment, and an evaluation of alternative means of achieving the objectives of the proposed amendment. The regulatory statement is set out in part 3 of this paper.

1.1.4 The Authority invites you to make a submission on the proposed amendment and the regulatory statement.

1.2 How to make a submission

1.2.1 Your submission is likely to be made available to the general public on the Authority's website. If necessary, please indicate any documents attached in support of your submission and any information that is provided to the Authority on a confidential basis. However, all information you provide to the Authority is subject to the Official Information Act 1982.

1.2.2 The Authority prefers to receive submissions in electronic format (Microsoft Word) in the format shown in Appendix A. Please email submissions in electronic form to submissions@ea.govt.nz with "Consultation Paper—Proposal to alter the way availability costs are allocated" in the subject line.

1.2.3 Do not send hard copies of submissions to the Authority unless it is not possible to do so electronically. If you cannot or do not wish to send your submission electronically, post one hard copy of the submission to either of the addresses provided below or fax it to 04 460 8879. You can call 04 460 8860 if you have any questions.

Postal address

Submissions
Electricity Authority
PO Box 10041
Wellington 6143

Physical address

Submissions
Electricity Authority
Level 7, ASB Bank Tower
2 Hunter Street
Wellington

1.3 Deadline for delivering a submission

1.3.1 Please deliver your submission by email or otherwise so it is received by **5pm** on **26 April 2016**. Please note that the Authority is unlikely to consider late submissions.

1.3.2 The Authority will acknowledge receipt of all submissions electronically. Please contact the submissions' administrator if you do not receive electronic acknowledgement of your submission within two business days.

2 The Authority wants to address a problem with the way availability costs are allocated

2.1 The existing arrangements for allocating availability costs

2.1.1 Instantaneous reserve is an ancillary service to the electricity market. Procuring this service ensures the power system remains stable after the sudden and unplanned failure of generation or transmission assets, which cause under frequency events.

2.1.2 Under frequency events occur because of an imbalance of generation and demand that results in the power system frequency dropping from normal levels (~50 Hz) to or below 49.2 Hz.

2.1.3 Under the Code, instantaneous reserve costs are referred to as the availability cost. The system operator incurs the availability cost in procuring instantaneous reserve. It is calculated by summing the total costs associated with procuring instantaneous reserve in each trading period (including constrained on amounts) in each island for each month.

2.1.4 Availability costs are allocated to parties that own assets that could cause under-frequency events if they fail; parties that cause the need for the system operator to procure instantaneous reserve. They include:

a) generators, in proportion to the quantity of electricity a generating unit generates in each trading period, over a de minimis threshold of 60 MW

b) Transpower, the owner of the high voltage direct connection (HVDC) link, in proportion to the HVDC's net transfer into an island in each trading period, over a de minimis threshold of 60 MW.

2.2 There is a problem with the way availability costs are allocated under a national market

2.2.1 Currently, the system operator procures instantaneous reserve and allocates the costs separately in the North Island and South Island.

2.2.2 Most of the time when the HVDC link is operating, the inertia of the load and generation in both islands helps stabilise the power system after any sudden loss of generation (or load) in either island. This reduces the amount of instantaneous reserve the system operator needs to procure in each island by up to 60 MW.

2.2.3 The Authority is working with the system operator to change the market systems to allow the system operator to procure instantaneous reserve nationally. A national instantaneous reserve market would allow the system operator to procure generation in one island to cover an under-frequency event in the other island. This would replace the existing method for inter-island reserve sharing and is likely to lead to significantly lower costs in the wholesale electricity market.

2.2.4 For instance, instantaneous reserve would be able to be procured in one island to cover the risk of a generator failure in the other. However, there is a problem with this situation when it comes to allocating the availability cost. If availability costs were allocated in the island in which reserve was procured, the generator that caused the system operator to procure the instantaneous reserve would not pay any of the cost they had imposed on the system.

2.2.5 A mismatch between procurement (national) and cost allocation (by island) means parties share of the availability costs do not adequately reflect the broader costs those parties impose on the system. In the long run, this mismatch could cause the generators involved to make inefficient plant investment and retirement decisions. Given the sums involved in such decisions, there is potential for significant efficiency losses in the millions of dollars, net present value. In the short term, this mismatch could alter the incentive on some generators to make their reserve offers at or close to their costs.

2.3 Why the Authority is addressing this problem now

2.3.1 The system operator intends to implement changes to the market systems in November 2016 to include a national instantaneous reserve market. For this reason, the Authority is making a proposal now to amend the Code to ensure the necessary clearing manager software changes are in place for November 2016.

2.3.2 The wholesale advisory group (WAG) is currently reviewing the instantaneous reserve availability cost and event charge. On 26 January 2016, as part of its review, the WAG's Chair wrote to the Authority recommending the Authority:

a) develop a proposal to allocate instantaneous reserve costs on a national basis, once a national instantaneous reserve market is introduced, when the HVDC is operating

b) makes preparations with the clearing manager in a timely fashion to ensure the timing of a national market is unaffected.

Q1. Do you agree this problem should be resolved at this time? If not, why not?

3 Regulatory statement for the proposed amendment

3.1 Objective of the proposed amendment

3.1.1 The objective of the proposed Code amendment is to ensure availability costs are allocated in a manner that encourages generators to make:

a) efficient plant investment and retirement decisions

b) reserve offers at or close to their costs.

3.1.2 Achieving the objective would promote the competition and efficiency limbs of the Authority's statutory objective. Consumers eventually benefit with lower power bills if generators make more efficient plant investment/retirement decisions and more competitive reserve offers.

Q2. Do you agree with the objective of the proposed amendment? If not, why not?

3.2 The proposed amendment

3.2.1 The Authority is proposing to amend clause 8.59 (Availability costs allocated to generators and HVDC owner) of the Code to achieve the objective.

3.2.2 Clause 8.59 provides that availability costs in a billing period must be allocated separately to persons in the North Island and South Island according to a prescribed formula. The formula would allocate the availability costs nationally for the majority of the time when the HVDC link is operating. When the HVDC link is not operating, availability costs would be allocated separately in each island.

3.2.3 The proposed Code amendment is in Appendix A.

3.3 The proposed amendment's benefits are expected to outweigh the costs

Costs of the proposed amendment

3.3.1 The clearing manager estimates the software changes required to implement the proposed Code amendment to be $25,000. The Authority has assumed that there are minimal costs incurred by participants that stem from this change (you should let us know if this assumption is untrue).

Benefits of the proposed amendment

3.3.2 The benefit of the proposed amendment is the potential efficiency losses avoided. The Authority has not estimated the value of the potential efficiency losses that would result from the perverse incentives caused by the existing method of allocating the availability cost. However, the amendment would provide a net benefit if it avoids distorting either:

a) one or more inefficient decisions to invest in or retire generation to the value of greater than $25,000. This appears to be highly plausible given the capital intensity of generation plant. For example, a single 100 MW thermal plant would be expected to cost $100 million or more.[1] A saving of $25,000

[1] Based on a capacity cost of $1 million per MW. This is at the lower end of the range for new peaking plant.

through optimisation of configuration/investment timing on such a plant would represent 0.025% of the capital cost.

b) reserve offers to the effect of $2,600 pa[2] reduction in deadweight losses in the spot market. This also appears plausible, given that $2,600 is equivalent to around 0.01% of annual reserves procurement costs.[3]

3.3.3 The Authority therefore considers it highly likely that some combination of both these effects will produce benefits that outweigh the costs associated with making the proposed amendment.

Q3. Do you agree the benefits of the proposed amendment outweigh its costs?

3.4 The Authority has identified three other means for achieving the objective

3.4.1 The Authority has identified three other means that would achieve the objective – options A, B and C. All three are alternative amendments to clause 8.59 of the Code.

3.4.2 Option A is less complicated than the proposed amendment. Under option A, instantaneous reserve availability costs would be allocated nationally at all times, even when the HVDC link is not operating.

3.4.3 Option B is a slightly more complicated variation of the proposed amendment. Under option B, availability costs would be split by island for trading periods when inter-island reserve sharing is unavailable (ie a national market is not operating). This option would account for the possibility the HVDC link is operating but in a mode that precludes any inter-island reserve sharing.

3.4.4 Option C is more complicated again. Under option C, availability costs for a trading period would be split by island according to the level of inter-island reserve sharing available.

3.4.5 For example, under option C, if 400 MW of instantaneous reserve was procured to cover the loss of a thermal unit in the North Island and the amount of inter-island reserve sharing was limited to 200 MW, half the availability cost would be allocated nationally and the other half could be allocated to causers only in the North Island.

3.5 The proposed amendment is preferred to other options

3.5.1 The Authority has evaluated these three options and prefers the proposed Code amendment.

3.5.2 Option A is not preferred because:

a) it is more efficient to allocate instantaneous reserve costs by island when the HVDC link is not operating

b) the Authority considers it is possible the HVDC link might become unavailable for an extended period and the proposal accounts for this possibility

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[2] Assumes $25,000 cost is recovered over 15 years at a discount rate of 6% per annum

[3] Reserves procurement costs have been around $20-$30 million per annum in recent time.

c) it is only $5,000 cheaper to implement.

3.5.3 The Authority is not able to quantify the degree to which the proposal is of greater net benefit than option A. However, it considers the extra cost ($5,000) to be cost-effective insurance against having to amend the Code in the event the HVDC link is out of service for an extended period.

3.5.4 Options B and C are also not preferred. This is because:

a) option C would be considerably more costly than the proposal to implement.

b) option B is ambiguous (should availability costs be allocated nationally even when only 1 MW of inter-island reserve sharing is available?) and is of little additional benefit.

3.5.5 A more complicated method for allocating availability costs is of little additional benefit because it is most important the allocation is efficient over time, rather than accurate in every trading period (assuming the allocation method does not distort offer behaviour). The Authority expects that the proposal would achieve this outcome given a range of normal operating conditions (swings and roundabouts).

3.5.6 Further, it is hard to see how increasing the degree of accuracy with which availability costs are allocated (beyond the level proposed) would materially improve the efficient decision making of generators. However, the Authority would especially like feedback on this untested assumption.

Q4. Do you agree the proposed amendment is preferable to the other options? If you disagree, please explain your preferred option in terms consistent with the Authority's statutory objective in section 15 of the Electricity Industry Act 2010.

3.6 The proposed amendment complies with section 32(1) of the Act

3.6.1 Table 1 (below) describes how the proposal complies with section 32(1) of the Act.

Table 1: How proposal complies with section 32(1) of the Act

Requirement	Comment
The proposed amendment is consistent with the Authority's objective under section 15 of the Act, which is to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers.	The proposed amendment would enhance productive efficiency and promote the competition and efficiency limbs of the Authority's statutory objective. It would: a. reduce a potential source of efficiency losses that could occur if availability costs are not allocated to their causers b. maintain the incentive on parties to offer reserve at least cost.

Requirement	Comment
The proposed amendment is necessary or desirable to promote any or all of the following:	
(a) competition in the electricity industry;	The proposed amendment would promote competition in the national instantaneous reserve market as, without it, some instantaneous reserve providers would no longer have an incentive to offer reserve at least cost.
(b) the reliable supply of electricity to consumers;	The proposed amendment is unlikely to have a material effect on the reliable supply of electricity to consumers.
(c) the efficient operation of the electricity industry;	The proposed amendment would promote the efficient operation of the electricity industry as it would ensure instantaneous reserve providers continue to have the incentive to offer instantaneous reserve at the least cost. This will improve productive efficiency.
(d) the performance by the Authority of its functions;	The proposed amendment will not materially affect the performance of the Authority.
(e) any other matter specifically referred to in this Act as a matter for inclusion in the Code.	The proposed amendment will not materially affect any other matter specifically referred to in the Act for inclusion in the Code.

Q5. Do you agree the Authority's proposed amendment complies with section 32(1) of the Act?

3.7 The Authority has given regard to the Code amendment principles

3.7.1 When considering proposed amendments to the Code, the Authority's consultation charter[4] requires it to have regard to the Code amendment principles (Table 2) to the extent that the Authority considers that they are applicable.

[4] The consultation charter is one of the Authority's foundation document and is available at: http://www.ea.govt.nz/about-us/documents-publications/foundation-documents/.

Table 2: Regard for Code amendment principles

Principle	Comment
1. Lawful	The proposal is lawful, and is consistent with the statutory objective (see section 3.6) and with the empowering provisions of the Act.
2. Provides clearly identified efficiency gains or addresses market or regulatory failure	The efficiency gains are set out in the evaluation of the costs and benefits (section 3.3).
3. Net benefits are quantified	The extent to which the Authority has been able to estimate the efficiency gains is set out in the evaluation of the costs and benefits (section 3.3).
4. Preference for small-scale 'trial and error' options	This principle is not applicable in this instance.
5. Preference for greater competition	This principle is not applicable in this instance.
6. Preference for market solutions	This principle is not applicable in this instance.
7. Preference for flexibility to allow innovation	This principle is not applicable in this instance.
8. Preference for non-prescriptive options	This principle is not applicable in this instance.
9. Risk reporting	This principle is not applicable in this instance.

Appendix A Proposed amendment

8.59 Availability costs allocated to generators and HVDC owner

(1) Subject to subclause (2), t~~T~~he **availability costs** for each **trading period** in a **billing period** must be allocated ~~separately to persons in the North Island and South Island~~ in accordance with the following formula:

$$Share_t = Ac_t * \frac{m_t}{M_t}$$

where

$Share_t$	is the **availability cost** allocated to a **generator** who owns **generating unit** x or to the **HVDC owner**~~**link**~~ for **trading period** t ~~for the North Island or South Island as appropriate~~
Ac_t	is the **availability cost** ~~for the North Island or South Island as appropriate~~ incurred in respect of **trading period** t
m_t	is $\max(0,INJ_{GENxt}-(h * INJ_D)-E^{IR}_{GENxt}) = m_{xt}$ for any **generating unit** is $\max(0,HVDC_{Riskt}-(h * INJ_D)-E^{IR}_{HVDCt}) = m_{ht}$ for the **HVDC link**
M_t	is $\Sigma_x m_{xt} + m_{ht}$
h	is 0.5 **MWh/MW**
INJ_{GENxt}	is the **electricity injected** (expressed in **MWh)** by **generating unit** x in **trading period** t ~~into the North Island or South Island as appropriate~~
E^{IR}_{GENxt}	is the quantity of any **instantaneous reserve** provided under any **alternative ancillary service arrangements** for **instantaneous reserve** authorised by the **system operator** for **generating unit** x in **trading period** t
$HVDC_{Riskt}$	is the **at risk HVDC transfer** (expressed in **MWh)** in **trading period** t ~~into the North Island or South Island as appropriate~~
E^{IR}_{HVDCt}	is the quantity of any **instantaneous reserve** provided under any **alternative ancillary service arrangement** for **instantaneous reserve** authorised by the **system operator** for **at risk HVDC transfer** in **trading period** t
INJ_D	is 60 **MW**.

(2) In relation to a **trading period** in which the HVDC link is out of service, the **availability costs** for that **trading period—**

(a) must be calculated separately for each **island** in accordance with the formula in subclause (1); and

(b) in each case, must be allocated to persons in the relevant **island**.

Q6. Do you have any comments on the drafting of the proposed amendment?

Appendix B Format for submissions

Submitter	

Question		Comment
Q1.	Do you agree this problem should be resolved at this time? If not, why not?	
Q2.	Do you agree with the objective of the proposed amendment? If not, why not?	
Q3.	Do you agree the benefits of the proposed amendment outweigh its costs?	
Q4.	Do you agree the proposed amendment is preferable to the other options? If you disagree, please explain your preferred option in terms consistent with the Authority's statutory objective in section 15 of the Electricity Industry Act 2010.	
Q5.	Do you agree the Authority's proposed amendment complies with section 32(1) of the Act?	
Q6.	Do you have any comments on the drafting of the proposed amendment?	
Clause	8.59	

Glossary of abbreviations and terms

Act	Electricity Industry Act 2010
Authority	Electricity Authority
availability charge	Cost of instantaneous reserve procurement to be allocated to causers
Code	Electricity Industry Participation Code 2010
reserve risk	Generating unit, AC or DC transmission element the loss of which the system operator must cover by procuring instantaneous reserve
Fast instantaneous reserve	As defined in part 1 of the Code
Sustained instantaneous reserve	As defined in part 1 of the Code.