

Review of participant audit regime

Decisions and reasons paper: Revised cost-benefit analysis

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1 The Authority has reviewed the participant audit regime

- 1.1 The Electricity Authority (Authority) is an independent Crown entity charged with promoting competition in, reliable supply by, and the efficient operation of the electricity industry for the long-term benefit of consumers.
- 1.2 The participant audit regime is the audit, certification, and approval processes that apply to auditors, participants, and the Authority under Parts 10, 11, and 15 of the Electricity Industry Participation Code 2010 (Code).
- 1.3 Between 10 November and 22 December 2015, the Authority consulted on a proposal to:
 - (a) clarify the purpose of the audit regime, and ensure it is well defined and aligned with the Authority's statutory objective
 - (b) improve the governance of the audit regime and better align it with international audit best practice
 - (c) improve the operational efficiency of the audit regime and support for the decisions being made as a result of audits.
- 1.4 This paper is an appendix to the Authority's decisions and reasons paper for the review of the participant audit regime.¹ This paper provides an updated cost-benefit analysis of the changes to the audit regime that incorporates relevant submissions received during consultation. We request that readers consider this paper and the decisions and reasons paper as a whole in terms of providing responses to changes to the cost-benefit analysis.

¹ Review of participant audit regime decisions and reasons paper can be found at:
<http://www.ea.govt.nz/development/work-programme/retail/review-of-participant-audit-regime/development/decisions-and-reasons-paper-and-summary-of-submissions-published>

2 Revised cost-benefit analysis

Changes to the cost-benefit analysis

- B.1 As a result of consultation, the cost-benefit analysis (CBA) has been updated to consider both changes to the preferred solutions and changes to the underlying assumptions.
- B.2 Table 1 discusses the impact of each change (both change to assumptions and change to solutions) to the CBA.

Table 1: Changes to CBA solutions and assumptions

Change	Description of changes relevant to CBA	Impact on costs and benefits	Comments
Keeping up with auditor protocol (Issue B.1.1)	<p><u>Number of hours required for auditors to keep up with auditor protocol:</u></p> <p><i>Consultation paper proposal</i> – assumed this would require one hour per auditor per annum.</p> <p><i>Final decision</i> – assumes this will require four hours per auditor per annum.</p>	<p><u>Costs:</u></p> <p>Increasing auditor time from one hour per auditor per annum to four hours per auditor per annum increases the cost by \$2,600 per annum. This increases the present value (PV) of cost by \$18,300.</p> <p><u>Benefits:</u></p> <p>No impact.</p> <p><u>Net impact:</u></p> <p>Net present value (NPV) reduces by \$18,000.</p>	
Auditor rotation (Issue B.3.1)	<p><u>How regularly auditor needs to be changed:</u></p> <p><i>Consultation paper proposal</i> – participant required to change auditor after two audits.</p> <p><i>Final decision</i> – participant</p>	<p><u>Costs:</u></p> <ol style="list-style-type: none"> 1. Removing one hour of auditor time for every second audit reduces PV of cost by \$71,000. 2. Increasing cost of audits where there is a new auditor (after two audits where the participant is audited at most annually and after two years where the participant is audited more frequently than annually) 	The calculation of the 25 % extra cost for audits where the auditor has not audited that participant before assumes that there is currently no auditor rotation. The Authority is aware that there is

Change	Description of changes relevant to CBA	Impact on costs and benefits	Comments
	<p>required to change auditor after the greater of two audits or two years.</p> <p><u>Assumption on hours required for auditor to get up to speed with a participant they have not audited before:</u> <i>Consultation paper proposal</i> – assumed auditor would take one hour to get up to speed with a participant they have not audited before. <i>Final decision</i> – assumes auditor would take 25 % longer to audit a participant they have not audited before (relative to a participant they have audited before).</p>	<p>by 25 % increases the PV of cost by \$525,000.</p> <p><u>Benefits:</u> Rotation of auditors is being introduced to assure auditor independence and objectivity, but this benefit is hard to quantify so was not quantified in the CBA.</p> <p>Requiring participants to change auditor the greater of every two audits or every two years means that participants that are audited more frequently than annually will be able to use the same auditor for more than two audits. This may reduce the auditor independence and objectivity (relative to what was proposed in the consultation paper) slightly, but the impact is expected to be small.</p> <p><u>Net impact:</u> NPV reduces by \$454,000.</p>	<p>currently some auditor rotation, but this is very minimal. This means that the cost of auditor rotation (\$525,000 in PV terms) is likely to be slightly overstated.</p>
Maintenance of standard issues register (Issue C.1.2)	<p><u>Number of hours required to maintain standard issues register:</u> <i>Consultation paper proposal</i> – assumed this would require ten Authority hours per annum. <i>Final decision</i> – assumes this would require 15 Authority hours per annum.</p>	<p><u>Costs:</u> Increasing the number of hours from ten to 15 per annum increases the cost by \$400 per annum. This increases the PV of costs by \$2,800.</p> <p><u>Benefits:</u> No impact.</p> <p><u>Net impact:</u></p>	

Change	Description of changes relevant to CBA	Impact on costs and benefits	Comments
		NPV reduces by \$3,000.	
Material change audits (Issue C.1.3)	<p><u>Number of material change audits per annum:</u> <i>Consultation paper proposal</i> – assumed there would be 1.5 more material change audits per annum than status quo. <i>Final decision</i> – assumes there is the same number of material change audits as in the status quo.</p> <p><u>Assessment of whether material change audit required:</u> <i>Consultation paper proposal</i> – no assessment of whether a material change audit is required. <i>Final decision</i> – describe a material change as a change that is likely to affect the ability of the participant to comply with any relevant provision of the Code. Amend auditor guidelines to include criteria for assessing if a change is material.</p>	<p><u>Costs:</u></p> <ol style="list-style-type: none"> 1. Removing additional 1.5 material change audits reduces the PV of cost by \$60,000. 2. Adding one auditor hour per medium or high complexity participant per annum increases the PV of cost by \$82,000. <p><u>Benefits:</u> No impact.</p> <p><u>Net impact:</u> NPV reduces by \$22,000.</p>	The Authority considers that it may have underestimated the number of additional material change audits that would be required under the consultation paper proposal. Therefore, the Authority expects that the changes it has made to material change audit requirements in the final decision are likely to reduce costs overall compared to the consultation paper proposal.
ISO removal	<u>Inclusion of ISO:</u>	<u>Costs:</u>	

Change	Description of changes relevant to CBA	Impact on costs and benefits	Comments
(Issue C.5.2)	<p><i>Consultation paper proposal</i> – included ISO audits for reconciliation participants.</p> <p><i>Final decision</i> – ISO audits no longer required for reconciliation participants. This removes costs associated with ISO audits, but will increase costs of reconciliation audits.</p>	<ol style="list-style-type: none"> 1. Reconciliation participant audits will require additional auditor hours –medium complexity audits are expected to take an extra five hours, while high complexity audits are expected to take an extra seven hours. Low complexity audits are assumed to require no increase in auditor hours, as the increase in hours is expected to be negligible and offset by the benefit of no longer requiring ISO audits for these same participants (which is also assumed to be zero). This increases the PV of cost by \$113,300. 2. The CBA in the consultation paper included ISO training costs (see paras 6.4.9(b) and (c) of consultation paper) of \$1,280 per annum for the Authority and \$7,000 per annum for ISO auditors. Taking out these training costs reduces the PV of cost by \$57,700. <p><u>Benefits:</u></p> <ol style="list-style-type: none"> 1. Removal of ISO requirements are estimated to provide a benefit of \$8,000 in auditor costs and three days internal participant time (per reconciliation participant per annum) for medium and high complexity participants. For low complexity participants the costs of ISO audits are estimated to be zero. While there would be a small ISO audit cost for low complexity reconciliation participants, removing this cost is likely to be offset by the increase in auditor hours required for low complexity reconciliation participant audits (which has also been assumed to be zero). Removing these costs increases the PV of benefit by \$1.375m. 2. The CBA in the consultation paper (in table 9, row 	

Change	Description of changes relevant to CBA	Impact on costs and benefits	Comments
		<p>C.5) included a benefit of “ISO auditor – defining quality certification scope in audit and participant guidelines and training will make the audit process more straightforward for auditors (-1 hour per reconciliation participant audits only)”. Taking out the quality certification benefit reduces the PV of benefit by \$49,000.</p> <p><u>Net impact:</u> NPV increases by \$1.271m.</p>	
DUML statistical sampling for field audits (Issue C.7.1)	<p><u>Full or statistical sampling field audits:</u> <i>Consultation paper proposal</i> – full field audits for DUML audits. <i>Final decision</i> – statistically significant sampling for field audits.</p> <p><u>Inclusion of field audits in the CBA:</u> <i>Consultation paper proposal</i> – the extra cost of full field audits was inadvertently left out of the CBA. <i>Final decision</i> – CBA includes cost of statistically significant sampling for field audits relative to status quo. Cost of</p>	<p><u>Costs:</u> Doubling the cost of DUML audits from \$1,752 to \$3,504 for poor quality audits and from \$1,348 to \$2,696 for good quality audits increases the PV of cost by \$435,000.</p> <p><u>Benefits:</u> Better processes for DUML field audits should reduce inaccuracies in DUML audits. Full field audits may reduce inaccuracies by more than statistically significant sampling for field audits, but the difference is expected to be minimal. The benefit of reduced inaccuracies is difficult to quantify, so this benefit has not been quantified.</p> <p><u>Net impact:</u> NPV reduces by \$435,000.</p>	<p>Overall, this change reduces the NPV relative to what was stated in the consultation paper. This is because the costs due to including full field audits were not included in the CBA.</p> <p>If it is assumed that full field audits cost twice as much as statistical sampling for field audits then inclusion of full field audits in the CBA would have reduced the NPV in the consultation paper by \$870,000.</p> <p>Moving from full field audits (as proposed in the consultation paper) to statistical sampling for field audits increases the NPV by</p>

Change	Description of changes relevant to CBA	Impact on costs and benefits	Comments
	DUML audits is assumed to double relative to status quo due to statistically significant sampling.		\$435,000. The net impact is that the NPV reduces by \$435,000.

Source: Electricity Authority

B.3 Table 2 separates the impact on the NPV of the changes above into two groups:

- changes to the assumptions in the CBA
- changes to the proposed solution.

Table 2: Impact of changes on the NPV

Change	Impact on NPV
Changes to CBA assumptions	
Higher cost of auditors keeping up with auditor protocol (Issue B.1.1) <i>(change from one hour per auditor per annum to four hours per auditor per annum)</i>	-\$18,000
Higher cost of using a different auditor (Issue B.3.1) <i>(change from one auditor hour per audit when a new auditor is used to a 25% uplift when a new auditor is used)</i>	-\$454,000 <i>(=\$71,000-\$525,000)</i>
Higher cost of maintenance of standard issues register (Issue C.1.2) <i>(change from 10 Authority hours per annum to 15 Authority hours per annum)</i>	-\$3,000
Inclusion of impact of full DUML field audits (Issue C.7.1) <i>(the impact of full DUML field audits was not included in the consultation paper CBA when it should have been – have assumed that full DUML audits cost twice as much as statistically significant sampling for DUML field audits)</i>	-\$870,000

Change	Impact on NPV
Total impact on NPV of changes to CBA assumptions	-\$1,358,000²
Changes to proposal/solution	
Change to auditor rotation requirement (Issue B.3.1) <i>(changing requirement to change auditor after two audits to changing auditor after the greater of two audits or two years)</i>	+\$13,000
Requiring auditor to assess whether a material change audit is required (Issue C.1.3) <i>(this will reduce number of material change audits relative to the proposal in the consultation paper and require extra auditor time for assessments)</i>	-\$22,000 ³
Removing ISO audits (Issue C.5.2) <i>(includes removal of any ISO-related costs and benefits in consultation paper CBA, removal of costs of ISO audits, and an addition of costs to reconciliation participant audits)</i>	+\$1,271,000
Change from full DUML field audits to statistically significant sampling for DUML audits (Issue C.7.1) <i>(assumes full DUML field audits cost twice as much as statistically significant sampling for DUML field audits)</i>	+\$435,000
Total impact on NPV of changes to proposal/solution	+\$1,697,000
TOTAL IMPACT ON NPV (relative to NPV in the consultation paper)	+\$339,000
NET PRESENT VALUE OF SOLUTION IN DECISIONS AND REASONS PAPER	\$2,945,000⁴

Source: Electricity Authority

² This compares to an expected NPV of \$2,605,000 in the consultation paper.

³ Note that the Authority considers the CBA in the consultation paper likely underestimated the cost of the material change audit proposal. The Authority considers that what is proposed for material change audits in this decision are lower cost than what was proposed in the consultation paper.

⁴ Numbers do not add up due to rounding.

Sensitivity analysis

- B.4 The consultation paper included sensitivity analysis that assessed the impact on the estimated NPV of:
- (a) the reductions in the frequency of audits happening over a longer period and/or the reductions in frequency not being as great as in the central assumption (this was shown in table 11 of the consultation paper)
 - (b) the increases in hours per audit under the proposal being larger than expected and the decreases in hours per audit under the proposal being smaller than expected (this was shown in table 12 of the consultation paper).
- B.5 The consultation paper showed that even with what the Authority considered quite extreme downside scenarios, the NPV of the consultation paper proposal would still be positive (\$596,000 over ten years, as shown in table 13).
- B.6 The Authority has reconsidered the sensitivity analysis in this update of the CBA for the decisions and reasons paper.
- B.7 The Authority has undertaken the following sensitivity analysis:
- (a) updated the sensitivity analysis scenarios included in the consultation paper where necessary for the changes detailed in table A above
 - (b) considered the impact of varying the assumptions on the key changes being made to the solution in this decisions and reasons paper, in particular:
 - (i) auditor rotation – assuming it would take an auditor longer to audit a participant they have not audited before than the 25 % assumed in the central scenario
 - (ii) material change audits – assuming it would require more than one auditor hour per medium or high complexity participant per annum to assess whether material change audits are required
 - (iii) ISO removal – assuming that not all reconciliation participants would avoid ISO costs
 - (iv) ISO removal – assuming that the increase in auditor hours required for reconciliation participant audits is higher than that assumed in the central scenario (which is an extra five hours per audit for medium complexity audits and an extra seven hours per audit for high complexity audits)
 - (v) DUMML statistical sampling for field audits – assuming that the introduction of statistical sampling for field audits more than doubles DUMML audit costs.
- B.8 Table 3 below, shows the impact on the NPV of varying each of these assumptions. There are two scenarios for each assumption, scenario one and scenario two:
- (a) scenario one assumes a moderate reduction in benefits or increase in costs compared to the central scenario

(b) scenario two assumes a high reduction in benefits or increases in costs compared to the central scenario.

Table 3: Sensitivity analysis

		Assumptions			Present value (\$000)		
		Central scenario	Scenario One	Scenario Two	Central scenario	Scenario One	Scenario Two
Consultation paper sensitivity analysis	Audit frequency reductions	See paragraphs 6.4.11–6.4.25 of consultation paper	Audit frequency reduces by less (scenario C in table 11 of consultation paper)	Audit frequency reduces by less and takes longer to reduce (scenario D in table 11 of consultation paper)	2,584	1,282	829
	Changes in hours per audit	Table 9 in consultation paper adjusted for: taking out one hour cost every second audit for auditor rotation taking out ISO quality certification benefit	Increases in hours are 25 % greater and decreases in hours are 25 % smaller relative to central scenario (scenario 2 in table 12 of consultation paper)	Increases in hours are 40 % greater and decreases in hours are 40% smaller relative to central scenario (scenario 3 in table 12 of consultation paper)	318	189	112
Sensitivity analysis for changes made in decisions and reasons paper	Auditor rotation	Auditor takes 25 % longer to audit a participant they have not audited before relative to a participant they have audited before	Auditor takes 30 % longer to audit a participant they have not audited before relative to a participant they have audited before	Auditor takes 35 % longer to audit a participant they have not audited before relative to a participant they have audited before	-525	-630	-735
	Material change audits	Auditors take one hour per annum to assess need for material change audits (medium or high complexity only)	Auditors take 25 % longer to assess whether material change audits are required relative to central scenario	Auditors take 40 % longer to assess whether material change audits are required relative to central scenario	-82	-102	-115
	ISO removal	All reconciliation participants avoid ISO costs	Only 75 % of reconciliation participants avoid ISO costs	Only 50 % of reconciliation participants avoid ISO costs	1,376	1,032	688
		Reconciliation participant audits require an extra 5 hours	Increases in reconciliation participant auditor hours are	Increases in reconciliation participant auditor hours are	-113	-142	-159

		Assumptions			Present value (\$000)		
		Central scenario	Scenario One	Scenario Two	Central scenario	Scenario One	Scenario Two
		(medium complexity) and 7 hours (high complexity)	25 % greater than the central scenario	40 % greater than the central scenario			
	DUML statistical sampling	Adding statistical sampling for DUML field audits doubles the cost of DUML audits	DUML statistical sampling costs 25 % more than the central scenario	DUML statistical sampling costs 40 % more than the central scenario	-435	-544	-609
NPV of CBA components that have sensitivity analysis (A)					3,123	1,085	12
NPV of all other CBA components (B)					-178	-178	-178
NPV of solution under each scenario (A+B)					2,945	907	-166

Source: Electricity Authority

- B.9 Under scenario two the NPV of the solution is negative. However, the Authority considers that the probability that the NPV of the solution becoming negative is negligible. The three key reasons for this are:
- (a) The assumptions under scenario two are relatively extreme (as was noted in paragraph 6.4.49 of the consultation paper).
 - (b) The solutions will also deliver benefits that the Authority has not attempted to quantify (as was noted in paragraph 6.4.50 of the consultation paper). The unquantified benefits include:
 - (i) better compliance with the Code by audited participants
 - (ii) improved accuracy
 - (iii) reduced costs for new entrant retailers
 - (iv) greater consistency and clarity.
- B.10 For the negative NPV in scenario two to be realised, all seven downside risks would need to occur. We consider that the probability of all seven of the downside risks coming to pass is extremely low.

Authority has concluded that with revised information the CBA is likely to remain net positive

- B.11 Following revision of the CBA the Authority believes that the net benefit for consumers is likely to be \$2.945m under the central assumption. This is an increase from \$2.605m identified in the consultation paper.

- B.12 For the purposes of the decisions and reasons the Authority has not attempted to quantify what could occur in high benefit scenarios, but instead has focussed on the potential impact of low benefit / high cost scenarios.
- B.13 It is possible in an extreme case that the NPV could be -166,000. However, the Authority considers this is unlikely to occur, and expects benefits of 2.945m NPV over 10 years as a result of these changes.

Glossary of abbreviations and terms

Act	Electricity Industry Act 2010
CBA	cost-benefit analysis
DUML	distributed unmetered load
NPV	net present value
OIA	Official Information Act 1982