ISBN 978-1-869455-90-3
Project no. 14.11/15108

Public version

Input methodologies review final decision

Transpower Incremental Rolling Incentive Scheme

Date of publication: 29 June 2017

Associated documents

Publication date	Reference	Title
20 September 2013	978-1-869453-24-4	Process and issues paper: Incentives for suppliers to control expenditure during a regulatory period
27 November 2014	978-1-869454-11-1	Final Reasons paper – Incremental rolling incentive scheme
27 November 2014	Determination	Incremental Rolling Incentive Scheme Methodology Amendments Determination
14 September 2016	978-1-869455-36-1	Input methodologies review: Process update paper
14 September 2016	Notice of intention	Amended notice of intention: Input methodologies review
20 December 2016	978-1-869455-44-6	Input methodologies review decisions: Introduction and process paper
20 December 2016	978-1-869455-53-8	Input methodologies review decisions: Framework for the IM review
20 December 2016	978-1-869455-51-4	Input methodologies review decisions: Report on the IM review
24 March 2017	978-1-869455-63-7	Input methodologies review draft decision: Transpower Incremental Rolling Incentive Scheme
24 March 2017	Excel Model	Transpower IRIS baseline adjustment demonstration model

Commerce Commission
Wellington, New Zealand

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Executive Summary

Review of the Transpower Incremental Rolling Incentive Scheme (IRIS)

X1. As part of the input methodology review (IM review) we have reviewed the operating expenditure incentive scheme applying to Transpower. This paper presents our final decision to change a provision of the Transpower IRIS IM as a result of the IM review. It explains that we have identified a problem with the Transpower IRIS IM, and our solution to that problem requires a change to the input methodology (IM).

X2. An IRIS is included in the Transpower IMs to help address an issue that occurs when price-quality paths are reset at periodic intervals. Specifically, while price-quality regulation creates an incentive to achieve efficiency gains, this incentive declines over the regulatory period. An IRIS counteracts this decline by providing Transpower with a constant incentive to make efficiency savings.

X3. The IRIS mechanism relies on an expenditure link between regulatory periods. The Transpower IRIS IM requires the Commission to estimate a baseline adjustment term to act as this link between regulatory periods.

X4. We remain of the view that having an IRIS for Transpower is relevant and appropriate. However, in reviewing the Transpower IRIS IM consistent with the IM review framework, we have identified two issues with the operation of the Transpower IRIS IM.

Issue 1 – Interaction between the IRIS and individual price-quality path (IPP) forecast

X5. The first issue identified with the current IRIS relates to how the IRIS mechanism interacts with Transpower's IPP forecast. The current IRIS mechanism assumes that any permanent savings made up to, and including, Year 4 are incorporated in the IPP forecast for the following regulatory control period (RCP). However, Transpower has informed us that its initial proposals for IPP forecasts are developed in Year 3 of the previous regulatory period, and therefore are unlikely to incorporate Year 4 savings in the forecast.

X6. If Year 4 permanent savings are not included in Transpower's final IPP allowance for the following RCP, then the IRIS mechanism will over-reward savings (and over-penalise overspends) in Year 4. In the absence of an adjustment, the reward for permanent savings would be almost twice the intended amount.

X7. Our solution to this issue involves making an adjustment to the IRIS mechanism so that it no longer assumes that the IPP forecast incorporates permanent savings made

by Transpower in Year 4. This requires an adjustment to the baseline adjustment term defined in the Transpower IRIS IM.[1]

X8. In the current Transpower IRIS IM, to act as a link between regulatory periods, the baseline adjustment term is determined using the value of non-recurrent differences (ie, temporary savings).

X9. To implement our solution, the baseline adjustment term defined in the Transpower IRIS IM needs to be modified to cover 'total' (ie, temporary and permanent) savings in Year 4, rather than just temporary savings. The wording for this change is set out in Attachment B.

Issue 2 –Approach to determining the baseline adjustment term

X10. The second issue with the IRIS, as raised previously by Transpower, relates to how we will determine the baseline adjustment term. In considering this issue, we have taken into account the implications of the change to the Transpower IMs explained in issue 1.

X11. Under the IM change, total savings in Year 4 need to be estimated.[2] This amount can be determined using an estimate of Transpower's temporary opex savings in Year 3 of the IPP. This is demonstrated in Attachment C.

X12. Although we do not consider any IM change is required to allow us to determine the baseline adjustment term (and to respond to issues raised by Transpower), we consider it is useful to provide further information and guidance on how we intend to estimate the value of temporary savings required for the baseline adjustment term.

X13. As part of this paper we outline two methods through which we intend to estimate temporary savings in Year 3 of RCP2. We expect that a back casting approach using the IPP forecast will be the most appropriate methodology for estimating temporary savings in a specific year.

X14. We have identified two separate back casting methods which we consider have the greatest potential. These approaches are:

X14.1 Method 1: Year 1 back cast.

X14.2 Method 2: Step and Trend back cast.

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1 The IRIS mechanism is dealt with in clause 3.6 of the Transpower Input Methodologies Determination 2010 – consolidated as of 28 February 2017, referred to as "the IMs" in this paper. The IM relating to IRIS is termed the "Transpower IRIS IM".

2 An estimate is required because there is no deterministic method to calculate this amount. This is because there is no direct link between historically incurred opex and opex forecasts under an IPP.

X15. Both approaches use a similar methodology, but with slightly different input assumptions. There is a trade-off between the two approaches because the Year 1 back cast is more susceptible to errors from one-off factors that affect the allowance in Year 1 of the next RCP, while the Step and Trend back cast is more susceptible to errors in the trend assumption used as part of the back cast.

X16. The most appropriate approach is likely to depend on the context of the IPP forecast and in particular how representative the Year 1 forecast is of the rest of the IPP and our ability to identify one-off factors.

X17. Therefore, we do not consider that it is appropriate to commit to one specific method at this stage and consider that both methods could be useful (including to cross-check against one another) at the time we set the baseline adjustment term.

Chapter 1: Introduction

Purpose of this paper

1. The purpose of this paper is to:

   1.1 explain our view on the issues with the Transpower incremental rolling incentive scheme input methodology (**Transpower IRIS IM**);[3]

   1.2 explain our solutions to these problems; and

   1.3 in doing so, explain our final decision to make changes to the Transpower IRIS IM as a result of the IM review.

2. This chapter sets out how this paper fits into the IM review and provides an overview and background on the Transpower IRIS.

Context: How this paper fits into the IM review

3. On 20 December 2016, we published our final decisions on all areas of the IM review with the exception of three areas where we have not yet reached decisions.[4] One of those areas is the Transpower IRIS, which is the focus of this paper.[5] Therefore, our review of the Transpower IRIS IM remains part of the IM review and as such, we have continued to apply our IM review framework for decision-making.[6,7]

4. In September 2016, we decided to progress the review of the Transpower IRIS IM on a longer timeframe than the rest of the IM review.[8] This was to allow more time to assess whether the concerns Transpower has raised about the operation of the Transpower IRIS mechanism amount to a problem with the current scheme and whether any improvements might involve changes to the Transpower IRIS IM.[9]

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3 The IRIS mechanism is dealt with in clause 3.6 of the Transpower Input Methodologies Determination, referred to as "the IMs" in this paper. The IM relating to IRIS is termed the "Transpower IRIS IM".

4 See Commerce Commission "Input methodologies review decisions: Summary paper" (20 December 2016).

5 The other two areas where we have not yet reached decisions on the IM review are the related party transactions provisions and the IMs relating to CPP information requirements for gas pipeline services. See Commerce Commission "Input methodologies review decisions: Introduction and process paper" (20 December 2016).

6 Commerce Commission "Notice of intention: Input methodologies review" (10 June 2015); subsequently amended by Commerce Commission "Amended notice of intention: Input methodologies review" (14 September 2016).

7 Commerce Commission "Input methodologies review decisions: Framework for the IM review" (20 December 2016).

8 Commerce Commission "Input methodologies review: Process update paper" (14 September 2016); Commerce Commission "Amended notice of intention: Input methodologies review" (14 September 2016).

9 Commerce Commission "Input methodologies review draft decisions: Report on the IM review" (22 June 2016), p. 146.

5. Having since undertaken further analysis on the operation of the Transpower IRIS, this paper presents our final decision to change part of the IRIS mechanism in the Transpower IRIS IM as a result of the IM review. It explains that we have identified a problem with the Transpower IRIS, and our solution to that problem, which requires a change to the Transpower IRIS IM.

Overview of Transpower IRIS

6. Under Part 4 of The Act, we are periodically required to make decisions that affect the price that Transpower can charge for transmitting electricity in New Zealand. The price-quality path also specifies minimum standards for service quality.

7. Transpower has an incentive to economise on expenditure when subject to a price-quality path because it is permitted to recover a fixed amount of revenue for the duration of the regulatory period. Transpower initially gains from any efficiency saving it makes because its costs fall, but revenue is maintained. Following a price-quality path reset, the benefits of the efficiency gain are shared with consumers because prices are reset at a lower level – consistent with the lower (efficient) level of expenditure.

8. An IRIS IM is included in the Transpower IMs to help address the issue that occurs when price-quality paths are reset at periodic intervals. Specifically, while price-quality regulation creates an incentive to achieve efficiency savings, this incentive declines (ie, the retention factor decreases) as the given regulatory period progresses.[10]

9. The decreasing retention factor exists because Transpower is able to retain the revenue associated with any efficiency saving made at the start of the regulatory period for a longer time than those savings made at the end of the regulatory period.[11] The declining incentive that exists under a price-quality path without an IRIS mechanism is known as the 'natural incentive'.[12]

10. In an attempt to counteract the declining strength of the natural incentive through the regulatory period, the IRIS was designed to allow Transpower to 'carry forward' the benefit of a saving in operating expenditure (opex) after the end of the regulatory period.[13] The IRIS IM only affects Transpower's opex because incentive

[10] A retention (or sharing) factor is the proportion of the benefits of any efficiency saving that is retained by Transpower. The remainder of the benefits will be shared with consumers.

[11] Efficiency savings are passed on to consumers (through lower prices) at the time of a price-quality path reset.

[12] For further background on how incentives to make efficiency savings are affected by the inclusion or not of an IRIS mechanism see: Commerce Commission "Input methodologies (Transpower) reasons paper" (December 2010), Section 7.5; Commerce Commission "Incentives for Suppliers to Control Expenditure During a Regulatory Period: Process and Issues Paper" (20 September 2013).

[13] In the absence of a carry forward mechanism, the natural incentive applies.

mechanisms concerning capital expenditure are covered under the Transpower capex IM.[14]

11. As explained in chapter 4, the IRIS mechanism relies on an expenditure link between regulatory periods. The Transpower IRIS IM requires the Commission to estimate a baseline adjustment term to act as this link between regulatory periods. This is because, under Transpower's IPP, like a customised price-quality path (CPP), expenditure forecasts do not use a specific 'base year' and so are not explicitly linked to historically incurred opex.[15]

Background – How we got to this point

12. The Transpower IRIS mechanism was introduced as part of the Transpower IM in 2010.[16] The mechanism was asymmetric; meaning efficiency gains and efficiency losses were not treated symmetrically, ie, the reward for making a gain was not equal to the penalty for making a loss of similar size.

13. Amendments were made to the Transpower IRIS mechanism in November 2014.[17] Following consultation, the Transpower IRIS was changed from the asymmetric mechanism to a symmetric mechanism. Under the revised mechanism, savings and losses are treated symmetrically which ensures that the opex savings retained by the supplier (ie, the 'retention factor') for efficiency gains/losses are constant over time.

14. The current Transpower IRIS IM requires us to estimate temporary savings (or overspends) in one specific year of the regulatory period (Year 4), which is used as an input to the baseline adjustment term.

15. The concept of temporary and permanent savings is important when considering the operation of an IRIS mechanism, as we need to identify the type of savings required so that an appropriate retention factor can be applied. We consider there are two types of savings in operating expenditure.[18]

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14 Commerce Commission "Consolidated Transpower Capital Expenditure Input Methodology Determination as at 5 February 2015" (5 March 2015).

15 Conversely, the setting of DPPs uses a specific 'base year' which is used as a basis for determining expenditure forecasts. See: Commerce Commission "Electricity Distribution Services Input Methodologies Determination 2012 – consolidated as of 28 February 2017" (28 February 2017) clause 4.1.1.

16 Commerce Commission "Transpower Input Methodologies Reasons Paper" (December 2010).

17 Commerce Commission "Amendments to input methodologies for electricity distribution services and Transpower New Zealand Incremental Rolling Incentive Scheme" (27 November 2014).

18 The concept of permanent and temporary savings and the effect of price-quality paths on the retention factor for regulated suppliers were discussed in our process and issues paper on the IRIS. See: Commerce Commission "Incentives for Suppliers to Control Expenditure During a Regulatory Period: Process and Issues Paper" (20 September 2013).

15.1 A permanent saving – which we describe as a saving that is maintained in every year after it is first achieved, ie, in perpetuity.[19]

15.2 A temporary saving – which we describe as a saving that only occurs in a single year.

16. The estimate of temporary savings in Year 4 of an RCP is referred to in the current IM as 'non-recurrent differences in penultimate year'.[20] It is the only estimate required in the Transpower IRIS IM because all other permanent and temporary savings can be determined mathematically. The Transpower IRIS IM does not specify precisely how these temporary savings should be estimated, but requires any value to be consulted on with interested parties.[21]

17. The draft decision for the IRIS IM that applies to CPPs for Electricity Distribution Businesses (EDBs) proposed an estimate of temporary savings (or non-recurrent differences) in Year 4 of the regulatory period using the same approach as the Transpower IM.[22] As part of the reasons paper on the draft decision we briefly outlined a Step and Trend back cast approach as a potential option to estimate temporary savings in Year 4 of the RCP.[23]

18. In response to the consultation on the draft decision on the IRIS IM that applies to EDB CPPs, Transpower outlined some of its concerns with estimating non-recurrent differences and the proposed approach.

19. The final decision on the EDB CPP IRIS IM removed the requirement for an estimate of non-recurrent differences because an alternative CPP-specific IRIS methodology was applied.[24] However, the need to estimate temporary savings remained an issue for Transpower's IRIS which is why the issue has been considered as part of the IM review.[25]

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19 The value of a permanent saving can therefore be assessed using the standard formula for perpetuities. Assuming the saving occurs at the start of every year, the relevant equation is: x + x/(1+r); where x is the annual saving, and r is the discount rate.

20 Commerce Commission "Transpower Input Methodologies Determination – consolidated as of 28 February 2017" (28 February 2017) clause 3.6.4 (3).

21 Commerce Commission "Transpower Input Methodologies Determination – consolidated as of 28 February 2017" (28 February 2017) clause 3.6.4 (4).

22 Outlined in the draft determination: Commerce Commission "Draft Electricity Distribution Services (Incremental Rolling Incentive Scheme) Input Methodology Amendments Determination 2015", (27 February 2015), para 3.3.7.

23 Commerce Commission "How we propose to implement further amendments to input methodologies for electricity distributors subject to price-quality regulation" (27 February 2015), paragraph 3.9, 3.10.

24 Commerce Commission "Further amendments to input methodologies for electricity distributors subject to price-quality regulation: Incremental Rolling Incentive Scheme (IRIS)" (25 November 2015).

25 If a business were to remain on a CPP for more than one regulatory period, the same issues with IRIS identified by Transpower would also arise.

20. We have identified some issues with the current IRIS mechanism for Transpower, and are changing the Transpower IRIS IM to better promote the policy intent of the IRIS as applied to Transpower's current regulatory period (ie, RCP2).

Structure of this paper

21. Following this introductory chapter:

    21.1 Chapter 2 introduces the IM review framework and outlines the two issues identified with the Transpower IRIS we wish to improve;

    21.2 Chapter 3 outlines issue 1: the interaction between the IRIS and the IPP forecast and our solution; and

    21.3 Chapter 4 outlines issue 2: determining the baseline adjustment term and our solution.

Chapter 2: Review of the Transpower IRIS

Purpose of this chapter

22. The purpose of this chapter is to:

    22.1 explain how we have applied the IM review framework in reviewing the Transpower IRIS; and

    22.2 explain that our review of the Transpower IRIS IM has highlighted opportunities to improve the way we have implemented the Transpower IRIS.[26]

IM review framework and Transpower IRIS

23. We have reviewed the Transpower IRIS IM in light of the IM review framework, which is set out in more detail in the IM review framework paper we published in December 2016.[27]

24. Consistent with the framework, in reviewing the Transpower IRIS IM we have considered whether the policy intent of the Transpower IRIS IM is still relevant, and whether the way the IRIS has been implemented could be more effective in achieving that policy intent, or achieve it in a way that better promotes s 52R or reduces complexity and compliance costs.[28] In doing so, we have identified two issues with the operation of the Transpower IRIS IM.

25. Our criteria for changing the Transpower IRIS IM is where this appears likely to:

    25.1 promote the Part 4 purpose in s 52A more effectively;

    25.2 promote the IM purpose in s 52R more effectively (without detrimentally affecting the promotion of the s 52A purpose); or

    25.3 significantly reduce compliance costs, other regulatory costs or complexity (without detrimentally affecting the promotion of the s 52A purpose).

26. We have also considered, where relevant, whether there are alternative solutions to the identified problems with the Transpower IRIS IM that does not involve changing the Transpower IM.

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[26] These opportunities to improve the implementation of the Transpower IRIS are then explored further in chapters 3 and 4 of this paper.

[27] Commerce Commission "Input methodologies review decisions – Framework for the IM review" (20 December 2016).

[28] See chapter 3 of "Input methodologies review decisions – Framework for the IM review" (20 December 2016) for more detail about this review element.

What is the policy intent of the Transpower IRIS IM?

27. An IRIS attempts to ensure the incentive to control expenditure and make savings are constant over time. Under standard price-quality regulation where price-quality paths are reset every five years, the natural incentive to make savings is greater at the start of the regulatory period than it is at the end.[29]

28. The current IRIS mechanism for Transpower was introduced at the time of setting RCP2.[30] At that time we determined that an appropriate policy intent was to use an IRIS mechanism to achieve a constant retention (or sharing) factor for all efficiency savings made by Transpower during RCP2.

Is the policy intent of Transpower IRIS still relevant?

29. We are only three years into the implementation of IRIS and as yet do not have any evidence to suggest that the policy intent of the current IRIS is inappropriate or not being met.[31] From conversations we have had with Transpower we understand that it is making decisions based on the assumption that the IRIS will provide it with a 34% retention factor.

30. We therefore remain of the view that having an IRIS for Transpower (to ensure the incentive to Transpower to make efficiency savings is constant over time) is relevant and appropriate.

31. In any event, given that Transpower is likely to have made operational decisions on the basis of the IRIS mechanism outlined at the beginning of RCP2, we do not consider it is appropriate to change the policy intent for IRIS during RCP2.

Could the implementation of the Transpower IRIS IM be improved?

32. While we remain of the view that the policy intent of the Transpower IRIS IM is relevant, our review has highlighted two issues with the way that policy intent has been implemented. The remainder of this paper goes on to consider these issues and our solutions to them:

    32.1 Chapter 3 explains a problem with the current assumption that Year 4 permanent savings are accounted for in the IPP forecast, and the solution for this.

    32.2 Chapter 4 explains the issue that has been raised due to the use of an 'estimated value' to determine the baseline adjustment term, and provides guidance on the methods we intend to use to estimate this term.

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29 That is, a supplier reaps the benefits of an expenditure saving made earlier in the period for a longer timeframe than an expenditure saving made just prior to the reset of the price-quality path.

30 Commerce Commission, "Incremental rolling incentive scheme input methodology amendments determination 2014" (27 November 2014).

31 Commerce Commission, "Incremental rolling incentive scheme input methodology amendments determination 2014" (27 November 2014).

Chapter 3: Issue 1 – Interaction between the IRIS and the IPP forecast

Purpose of this chapter

33. This chapter provides details on an issue related to the interaction between the Transpower IRIS mechanism and the IPP forecast and our adjustment to the Transpower IM to address it.

Structure of this chapter

34. This chapter outlines:

    34.1 the IPP forecasting issue with the current approach in the Transpower IRIS IM; and

    34.2 our solution to the problem.

Problem definition

35. The current IRIS mechanism in the Transpower IM assumes that any permanent savings made up to, and including, Year 4 are incorporated in Transpower's IPP forecast.[32] However, Transpower has informed us that its initial IPP forecasts are developed in Year 3 of the previous regulatory period, and therefore are unlikely to incorporate Year 4 savings in the forecast.

36. Therefore, if Year 4 permanent savings are not included in Transpower's final RCP3 IPP forecast, then a problem arises because the IRIS mechanism will over-reward savings (and over-penalise overspends) in Year 4.[33]

37. In the absence of an adjustment, the reward for permanent savings would be almost twice the intended amount. Transpower would be rewarded through both the unadjusted IPP forecast, and again through a recoverable cost under the IRIS (the opex incentive).[34] This situation results in a retention factor of 64% for permanent savings made in Year 4, almost double the intended 34% retention factor.[35]

Proposed solution

Two potential solutions

38. We have considered two potential solutions to maintain the consistent retention factor for Transpower:

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32 Commerce Commission "Transpower Input Methodologies Determination – consolidated as of 28 February 2017" (28 February 2017) clause 3.6.4.

33 Although we refer to RCP3 here as an example of the next regulatory period, the problem would apply for all future regulatory periods.

34 Commerce Commission "Transpower Input Methodologies Determination – consolidated as of 28 February 2017" (28 February 2017) clause 3.6.2.

35 Under the current IPP WACC value.

38.1 Option 1 – involves identifying and removing Year 4 permanent savings from the IPP forecast allowance proposed by Transpower.

38.2 Option 2 – involves an adjustment to the IRIS mechanism so that it no longer assumes that IPP forecasts incorporate permanent savings made by Transpower in Year 4. This will require an adjustment to the definition of the baseline adjustment term in the Transpower IRIS IM.

39. We consider there will be difficulties in removing Year 4 permanent savings from Transpower's IPP forecast, ie, Option 1 above. Although we will know the level of the opex spend in Year 4 by the time we set the Transpower IPP, attempting to determine permanent savings accurately will be difficult. This value would then need to be removed from the IPP forecasts which will have been based on expenditure proposals provided by Transpower more than a year earlier.

Solution

40. Given the potential difficulties in removing Year 4 permanent savings from Transpower's IPP forecast, our solution is to implement Option 2. This option applies a more mechanistic approach, without adding significant complexity to the existing IRIS mechanism.

41. We consider that this approach will better implement the policy intent, and would reduce the onus on Transpower and the Commission to identify and remove Year 4 permanent savings from the IPP forecast.

42. To be consistent with the policy intent of the IRIS mechanism and to maintain a constant retention factor of 34%, a baseline adjustment term is estimated to act as a link between two regulatory periods.[36] The current Transpower IRIS IM uses the value of non-recurrent differences (ie, temporary savings) in Year 4 as the input to the baseline adjustment term.[37] This is based on the previous assumption that Year 4 permanent savings are included in Transpower's IPP forecasts – which we now consider is unlikely to be the case.

43. To implement this solution, the baseline adjustment term defined in the Transpower IRIS IM would need to be adjusted to cover 'total' (ie, temporary and permanent) savings in Year 4, rather than just temporary savings, defined as the 'difference term'.[38]

44. The updated baseline adjustment term reduces the net present value of these savings to the supplier such that they only retain the appropriate retention factor of

[36] The baseline adjustment term is explained in further detail in Chapter 4 of this paper.

[37] Commerce Commission "Transpower Input Methodologies Determination – consolidated as of 28 February 2017" (28 February 2017) clause 3.6.4 (3).

[38] Commerce Commission "Transpower Input Methodologies Determination – consolidated as of 28 February 2017" (28 February 2017) clauses 3.6.4 (3) and 3.6.4 (4).

34%, consistent with the IRIS policy objective. This ensures that the target retention factor of 34% will be maintained.

45. Transpower supported this proposed change in its submission:

> We agree with the Commission's proposal to adopt its Option 2, to amend the IRIS mechanism so that it no longer assumes that the IPP forecast incorporates permanent savings in year 4.[39]

46. Our decision is to change the Transpower IRIS IM with immediate effect because it adjusts the IRIS mechanism to give better effect to the original policy intent and it does not have the effect of re-opening the price-path.[40]

47. Further details on the problem with the current methodology and our solution are provided in attachments to this paper:

    47.1 Attachment A explains the problem and solution using a worked example.

    47.2 Attachment B provides the drafting changes to the Transpower IRIS IMs.

    47.3 Attachment C outlines how, through implementing the changes to the Transpower IRIS IM, we are able to determine the total savings in Year 4 (ie, the 'differences in penultimate year' required by the Transpower IM) by estimating temporary savings in Year 3.

[39] Transpower "Submission on Transpower IRIS draft decision" (20 April 2017).

[40] The amendment determination published alongside this document is effective 29/06. This has been outlined in the Gazette notice published 29/06.

Chapter 4: Issue 2 – Approach to determining the baseline adjustment term

Purpose of this chapter

49. This chapter outlines the difficulties in estimating the baseline adjustment term and the methods we intend to use to estimate this term.

Structure of this chapter

50. This chapter outlines:

    50.1 how the IRIS mechanism relies on an expenditure link between two regulatory periods;

    50.2 an explanation of the baseline adjustment term;

    50.3 issues identified in estimating the baseline adjustment term; and

    50.4 the methods we intend to use to estimate this term.

Problem definition

51. Transpower has previously raised concerns regarding the judgement and accuracy of the Commission in being able to estimate temporary savings during the regulatory period in estimating the baseline adjustment term. Transpower claims that the uncertainty can affect the decisions it makes when determining whether to pursue efficiency gains.

52. To help Transpower and others to understand this issue, we have set out below how the Transpower IRIS mechanism relies on an expenditure link between two regulatory periods and what the baseline adjustment term is.

The IRIS mechanism relies on expenditure links between two regulatory periods

53. The IRIS mechanism attempts to ensure that Transpower's incentives to control opex and make savings are constant over time. This relies on an explicit expenditure link between regulatory periods.

54. For a default price-quality path (DPP), there is a direct link between the costs in one regulatory period and the next. This approach works well with the IRIS scheme as we are able to identify incremental improvements in opex efficiency and appropriately reward suppliers using a mechanical IRIS mechanism. The direct link between periods ensures that the IRIS mechanism under a DPP is able to automatically calculate the appropriate incentive rewards and penalties.

55. Under an IPP, the calculations are more complicated because the allowance for opex is not determined by projecting forward an initial level of opex from a base year (Year 4) in the previous period. Therefore, a discontinuity arises that breaks the link between expenditure in one period and the next. To correct for this discontinuity, an adjustment is required that corrects for any incorrectly compensated savings or losses.

56. The main difference between a DPP and an IPP is that, in a DPP, the forecast will include all savings (both temporary and permanent) that were made in Year 4.[41] Although including the effect of temporary savings within the DPP forecast is a distortion, it has the beneficial effect under an IRIS of offsetting the incremental change in Year 4 (due to temporary savings) that would otherwise be wrongly rewarded as part of the IRIS opex incentive.

57. However, with an IPP, the assumption is that only permanent savings in the previous period are incorporated in the forecast, because the forecast is determined independently (i.e., on a bottom-up basis). As a result there is no offsetting of the inaccurate opex incentive that arises from temporary savings in Year 4 (i.e., penultimate year of the regulatory period). Suppliers are therefore over-rewarded for any temporary savings in Year 4 or over-penalised for any temporary overspends.

What is the baseline adjustment term?

58. To adjust for the expenditure disconnect between IPP periods and the error in the opex incentive we must make a revenue adjustment. We do this through a 'baseline adjustment term', which has the effect of re-establishing the link between the expenditure baseline and expenditure in the previous period. The baseline adjustment term acts to link expenditure between the IPP periods and is applied to Transpower's revenues in the following regulatory period.[42,43]

59. In the current Transpower IRIS IM, the relevant adjustment amount provided through the baseline adjustment term is equal to the distortion created by any temporary (or 'non-recurrent') differences between forecast and actual expenditure in the penultimate year (Year 4) of the preceding regulatory period. This negates the opex incentive that would otherwise be wrongly attributed to temporary savings in Year 4.

60. The change to the Transpower IRIS IM means that the baseline adjustment term will also now include permanent savings made in Year 4 of the regulatory period in addition to temporary savings. This new element of the baseline adjustment term will offset the additional revenue allowance that is provided to Transpower when permanent savings are made in Year 4 but they are not incorporated in the IPP opex forecast.[44,45]

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41 This is because opex forecasts under a DPP are determined by projecting forward from a selected base year in the previous regulatory period.

42 This is the 'adjustment to the opex incentive' which is the sum of the 'baseline adjustment term' and the 'base year adjustment term'. See clause 3.6.4 of the Transpower IM.

43 Spreading this adjustment across Years 2-5 of a regulatory period was an IM change made in the final IM review decisions in December 2016.

44 Broadly speaking, without this change Transpower would get rewarded twice for any permanent savings, once through the IRIS opex incentive and once through the maintenance of the 'pre-saving' revenue allowance under RCP3.

45 For details on our IM change see Chapter 3.

61. Attachment A demonstrates what the revised baseline adjustment term is intending to achieve and why it is consistent with our policy intent.

62. Attachment C outlines how total savings can be calculated if we have an estimate of Transpower's temporary opex savings in Year 3 of the IPP.

63. There is no deterministic method to calculating temporary (non-recurrent) differences for a specific year in the regulatory period due to the lack of an explicit link between actual historical opex and IPP opex forecasts.[46] Transpower has previously submitted that it agrees with this view.[47]

Problem associated with estimating temporary and permanent savings in a specific year

Savings made in a specific year are unobservable and require an estimate

64. Transpower has stated that the Commission's ex-post assessment of penultimate year opex savings introduces a high degree of uncertainty to Transpower,[48] suggesting that this can affect the decisions that Transpower faces when determining whether to pursue efficiencies requiring up-front capital or opex to be incurred:[49]

> Under current opex reset conditions there is no reliable or predictable method for determining IRIS credits (or debits), which means suppliers cannot confidently assess the expected return on efficiency investments. This undermines the policy intent of this IRIS, which is to strengthen incentives to make efficiency improvements.

65. The difference term (total savings in Year 4 of RCP2) is unobservable. We propose to use the value of temporary savings in Year 3 of RCP2 to determine the difference term, however this value is also unobservable.[50] Savings (or expenditure overruns) can be classified as permanent or temporary in nature, but these classifications are not discernible. Therefore the Year 3 temporary savings cannot be identified precisely and must be estimated.

66. In submissions received from Transpower to the draft decision on the IRIS applied to the transition to a CPP,[51] Transpower raised concerns regarding the judgement and

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46 Although this is not a perfect solution, we do not think this should affect the incentives on Transpower to make efficiency savings as long as they are satisfied that we will be unbiased in determining this term. It may, however, increase the risk we will not be able to observe the actual value of this term and so Transpower will be exposed to estimation error.

47 Transpower, "Transpower – submission on further amendments to IRIS for EDBs – 20 March 2015", (20 March 2015) Page 3.

48 Transpower, "Transpower – submission on further amendments to IRIS for EDBs – 20 March 2015", (20 March 2015) Page 5.

49 Transpower, "Transpower – submission on further amendments to IRIS for EDBs – 20 March 2015", (20 March 2015) Page 1.

50 Attachment C explains how we can use an estimate of temporary savings in Year 3 of RCP2 to determine total savings in Year 4.

51 The IRIS that is applied to Transpower under an IPP is the same as the IRIS that was proposed for electricity distribution businesses subject to (or transitioning to) customised price-quality paths (CPPs).

accuracy of the Commission in being able to estimate temporary savings in a specific year during the regulatory period.[52] For example, Frontier (for Transpower) stated:[53]

> However, the IRIS modification provides for the Commission to determine what proportion of Transpower's savings will be classed as one-off versus permanent. It is difficult to see how the Commission could make this assessment accurately and predictably. Much will depend on the Commission's subjective judgements, informed – or perhaps influenced – by consultation with other stakeholders.

Impact of estimating the difference term

67. We agree with Transpower's view that there is likely to be an error in our estimate of temporary savings because temporary savings cannot easily be isolated from permanent savings made either in that year, or earlier in the regulatory period. The magnitude of the error will depend on the accuracy of the estimation methodology, and therefore our goal when setting a methodology is to minimise errors as much as possible.

68. However, we do not agree that the potential for there to be a difference between the true value of temporary savings in Year 3 and our estimate undermines the policy intent of the IRIS. The IRIS provides an expectation of a 34% retention factor, and even though ex-post it could be higher or lower, the incentive to make efficiency savings remains the same as long as our estimate of temporary savings is unbiased.

69. This type of estimation of unobservable values is common under incentive regulation. There are a number of input assumptions to Transpower's revenue allowance which are similarly unobservable and where our assumption may be different to the true value. For example, we are required to estimate the cost of capital and an efficient level of opex which are both unobservable values.

70. We therefore disagree that our approach is inconsistent with the IRIS policy intent which is to encourage Transpower to undertake efficiency savings by allowing them to keep 34% of the value of the saving.

71. We agree that the requirement to make an estimate of temporary savings does increase the risk of Transpower's revenue being inconsistent with the 34% retention factor. However, the risk is symmetrical, i.e., not biased in either direction. There is the same chance of Transpower's ex-post revenue being consistent with a higher retention factor as a lower retention factor.

This is because CPP and IPP forecasts are created in a similar way, ie, from the bottom up, not built off the forecast in the previous regulatory period.

52 Commerce Commission "How we propose to implement further amendments to input methodologies for electricity distributors subject to price-quality regulation" (27 February 2015).

53 Frontier Economics, "Transpower – submission on further amendments to IRIS for EDBs - 20 March 2015", (March 2015) Para 3.2.2.

72. Although there is a small level of uncertainty associated with the level of IRIS recoverable costs, dependent on the estimate of temporary savings, we consider that Transpower should be able to manage this uncertainty.

73. The fact that the risk of under or over recovery is symmetrical means that, even though an estimate is used, it should not affect the way in which Transpower operates and the operational decisions that it makes. Therefore we do not consider any change to the current Transpower IM needs to be made as a result of the uncertainty associated with estimating the difference amount used in the baseline adjustment term.

Solution

74. Although we do not consider any Transpower IRIS IM change is required to deal with the estimation issues raised by Transpower, we consider it is beneficial to provide further information at this stage on how we intend to estimate the value of temporary savings required for the baseline adjustment term. Transpower is supportive of this approach.[54]

Estimate of Year 3 temporary savings

75. The change to the Transpower IRIS IM described in chapter 3 will require us to determine *total* savings in Year 4 (the difference term) rather than temporary savings in Year 4. Attachment C describes how we can determine total savings in Year 4 by making an estimate of temporary savings in Year 3. As a result, this chapter focuses on the estimate of Year 3 temporary savings, rather than Year 4 temporary savings.

Potential methods to estimate the difference term

76. As part of this paper we outline two methods which we intend to use to estimate the difference term. We expect to cross reference these methods against each other in order to develop a final estimate. We first need to estimate Year 3 temporary savings, from which we can then determine Year 4 savings (the difference term), and then the final value for the baseline adjustment term.

77. We consider that a back casting approach from the IPP forecast is an appropriate methodology for estimating temporary savings in Year 3. We have identified two separate back casting methods which we consider have the greatest potential. These approaches are discussed below.

    77.1 Method 1: Year 1 back cast.

    77.2 Method 2: Step and Trend back cast.

[54] Transpower "Submission on Transpower IRIS draft decision" (20 April 2017).

78. Both approaches use a similar methodological approach, with slightly different input assumptions. We published a model alongside the draft decision paper to demonstrate these different approaches.[55]

79. Transpower supported these options in its submission:

> We support the Commission's suggestion of using either or both of their proposed approaches to estimate temporary savings in Year 3 of the second regulatory control period (RCP2), depending on the context of the IPP forecast.[56]

Year 1 back cast

80. The Year 1 back cast requires us to estimate a general trend in opex.[57] We then use this value to trend back from Year 1 of RCP3 to Year 3 of RCP2. This enables us to determine an estimate for opex in Year 3 of RCP2 that is consistent with the overall trend in opex and does not include any temporary effects.

81. Any difference between this estimate of opex costs in Year 3 and the actual incurred cost can then be assumed to be temporary savings. This is because Year 1 of the RCP3 forecast is assumed to include any permanent savings made in RCP2, but not any temporary savings. Therefore, when we trend back from a starting point in RCP3 on a consistent basis, temporary savings can be identified.

82. However, because the trend is back casted from one specific year of the IPP (Year 1), we also need to take into account:

    82.1 any one-off factors associated with the forecast of opex in Year 1 of RCP3; and

    82.2 any permanent 'step changes' in opex that have taken place between Year 3 of RCP2 and Year 1 of RCP3 that are not captured by the trend assumption.[58]

83. Figure 1 illustrates the Year 1 back cast approach.[59] The two key assumptions required are an estimate of the opex trend which is used to trend back over three years, and an estimate of one-off factors in the Year 1 IPP forecast.

84. These two input assumptions affect the estimate of efficient costs in Year 3 and it is therefore the estimate of temporary savings.

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55 Commerce Commission "Transpower IRIS baseline adjustment demonstration model" (24 March 2017).

56 Transpower "Submission on Transpower IRIS draft decision" (20 April 2017).

57 To illustrate how this would work, we are referring to RCP2 and RCP3, but this would apply to future regulatory periods.

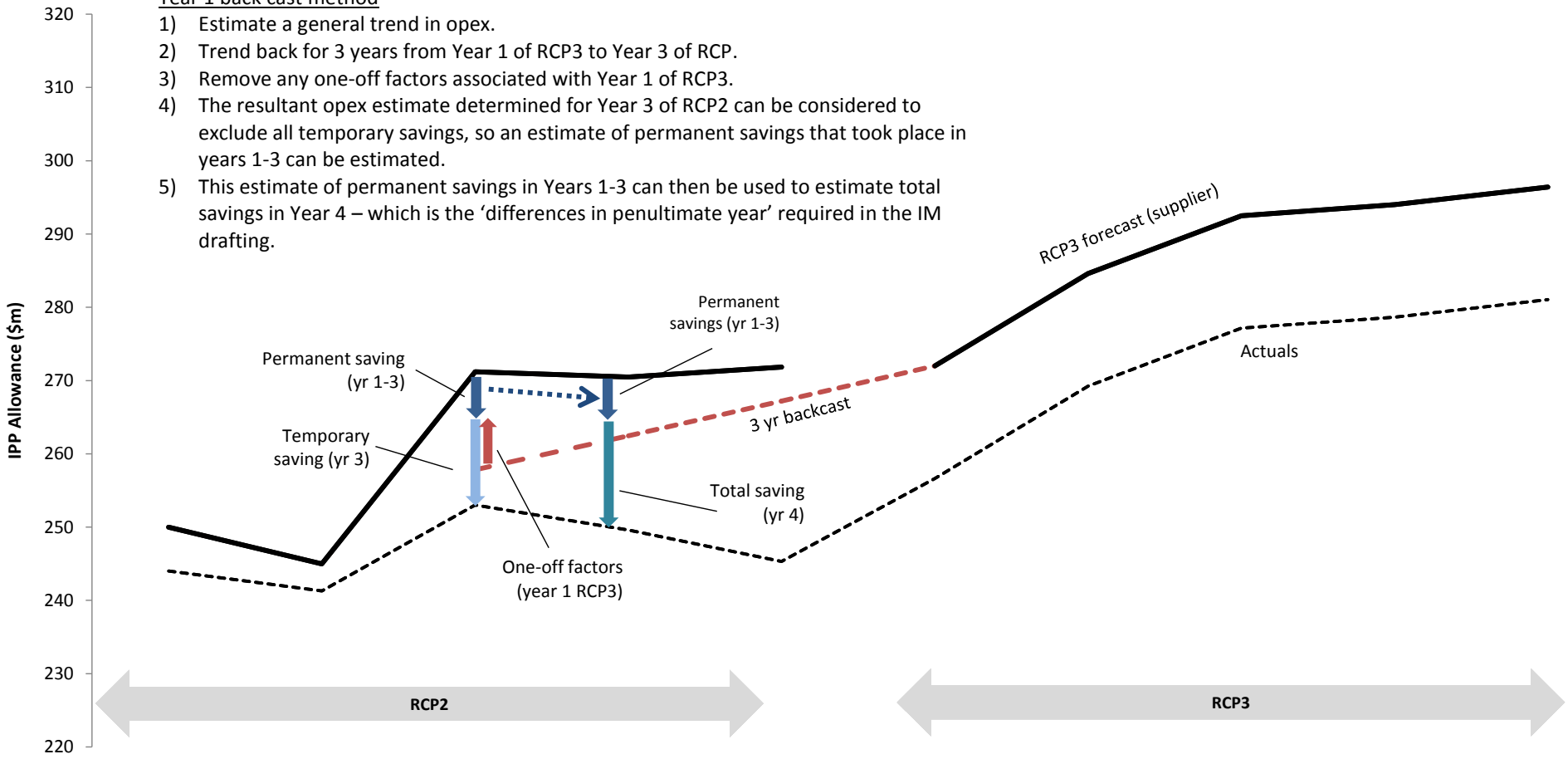
58 For example, a change in legislative or regulatory requirements may result in a 'step change' in opex.

59 Note that this example does not include any permanent step change in expenditure, between Year 3 of RCP2 and Year 1 of RCP3.

Figure 1 – Year 1 back cast example

<u>Year 1 back cast method</u>

1) Estimate a general trend in opex.
2) Trend back for 3 years from Year 1 of RCP3 to Year 3 of RCP.
3) Remove any one-off factors associated with Year 1 of RCP3.
4) The resultant opex estimate determined for Year 3 of RCP2 can be considered to exclude all temporary savings, so an estimate of permanent savings that took place in years 1-3 can be estimated.
5) This estimate of permanent savings in Years 1-3 can then be used to estimate total savings in Year 4 – which is the 'differences in penultimate year' required in the IM drafting.



85. Figure 1 also shows how this estimate of temporary savings enables us to determine permanent savings that have taken place in Years 1-3 of RCP2 and which can then be used to determine total savings in Year 4. Total savings in Year 4 is the value required for the baseline adjustment term.

Step and Trend back cast[60]

86. The Step and Trend back cast is similar to the Year 1 back cast, but instead of trending back from Year 1 of RCP3, we create a Step and Trend forecast for RCP3 that:

    86.1 is equivalent to the IPP forecast in RCP3 in present value (PV) terms; and

    86.2 increases each year in line with the estimated opex trend.

87. This new forecast is then extended back to Year 3 of RCP2 and the forecast is assumed to include permanent savings that took place in Year 3 of RCP2, but not temporary savings. An estimate for temporary savings can therefore be identified in a similar way to the Year 1 back cast approach.

88. Figure 2 illustrates the Step and Trend back cast method, including how an estimate of temporary savings in Year 3 can be used to determine an estimate of total savings in Year 4 for use in the baseline adjustment term.[61]

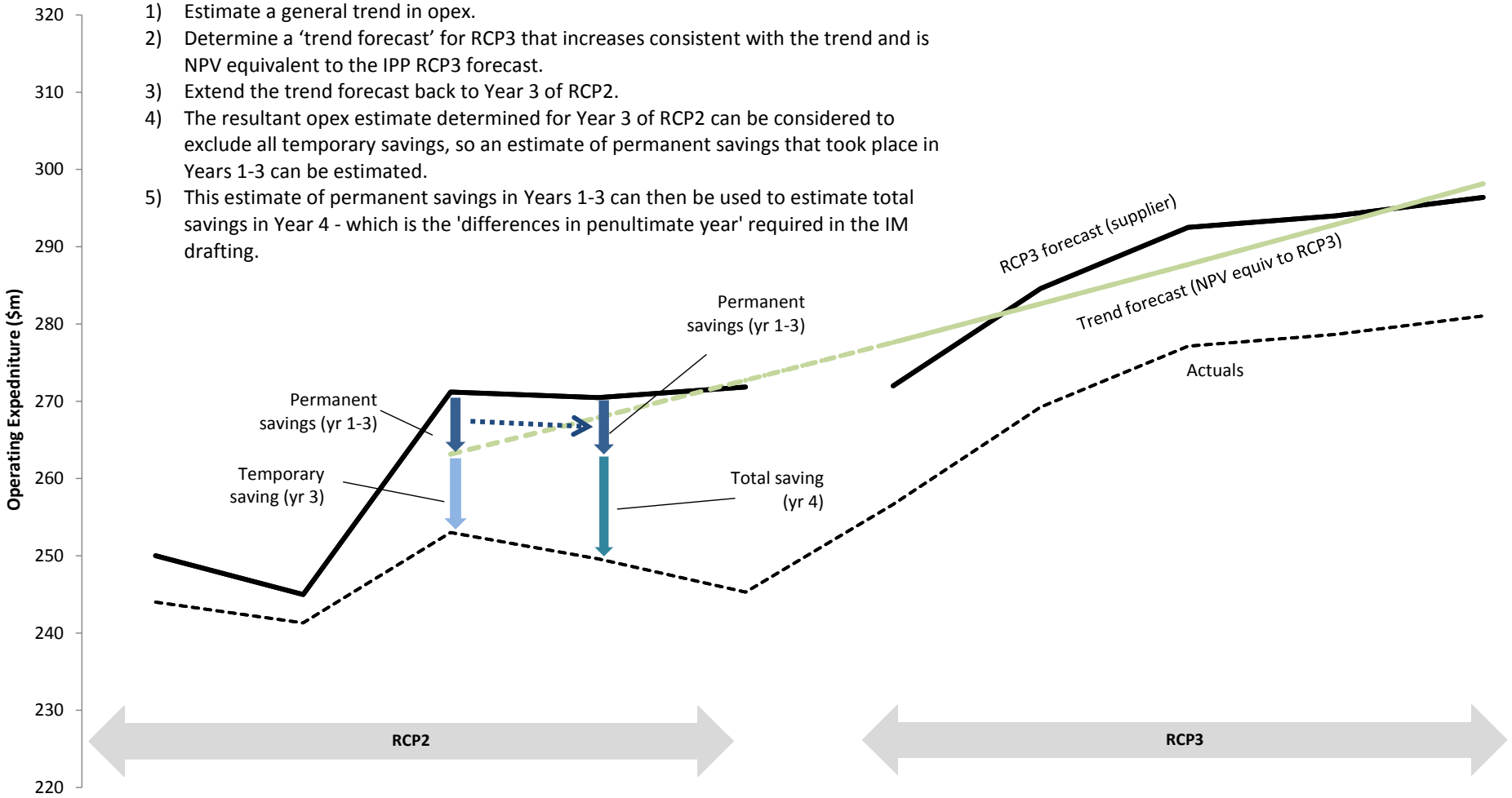
[60] To illustrate how this would work, we are referring to RCP2 and RCP3, but this would apply to future regulatory periods.

[61] Note that this example does not include any permanent step change in expenditure, between Year 3 of RCP2 and Year 1 of RCP3.

Figure 2 – Step and Trend back cast example

<u>Step and Trend back cast method</u>

1) Estimate a general trend in opex.
2) Determine a 'trend forecast' for RCP3 that increases consistent with the trend and is NPV equivalent to the IPP RCP3 forecast.
3) Extend the trend forecast back to Year 3 of RCP2.
4) The resultant opex estimate determined for Year 3 of RCP2 can be considered to exclude all temporary savings, so an estimate of permanent savings that took place in Years 1-3 can be estimated.
5) This estimate of permanent savings in Years 1-3 can then be used to estimate total savings in Year 4 - which is the 'differences in penultimate year' required in the IM drafting.



Comparison of the two methods

89. The two methods both result in an estimate of temporary savings in Year 3, from which we can determine total savings in Year 4. The key difference between the two approaches is the required input assumptions and the estimation error that results from getting those assumptions wrong.

90. Broadly speaking:[62]

    90.1 The accuracy of the Year 1 back cast is dependent on our estimate of the opex trend, and the extent to which we can identify one-off factors in Year 1.

    90.2 The accuracy of the Step and Trend back cast is dependent on our estimate of the opex trend. However, any error in the trend assumption has a bigger impact under the Step and Trend back cast approach than under the Year 1 back cast approach because it is applied over a longer time period.

91. There is a trade-off between the two approaches because the Year 1 back cast approach has an additional input assumption (with the potential for additional error), but using the Step and Trend back cast results in a bigger impact from any error in the trend assumption.

92. We consider that both of these methods will provide a reasonable estimate of temporary savings in Year 3. The most appropriate approach is likely to depend on the context of the IPP forecast and in particular how representative the Year 1 forecast is of the rest of the IPP and our ability to identify one-off factors.

93. Further information on how any errors in our input assumptions under both of these methods affects the IRIS retention factor is provided in Attachment D.

94. We do not consider that it is appropriate to commit to one specific method at this stage and consider that both methods could be useful (including to cross-check against one another) at the time we set the baseline adjustment term.

Estimating an opex trend

95. A key aspect of both methods is to estimate an opex trend assumption. At this stage we do not have a precise method to do this, but we expect to incorporate historical information on opex and information used for the IPP forecast. We will consult on this approach at the time of setting the baseline adjustment term.

[62] In addition, the accuracy of the estimate under both approaches will depend on the identification of any permanent step changes in opex between Year 3 in RCP2 and RCP3. This will affect both methods equally.

When is it most efficient for us to determine the baseline adjustment term?

96. We consider that it is appropriate to estimate the baseline adjustment term at the same time as setting the IPP. This increases process efficiency as we can undertake a combined consultation.

97. Estimating the baseline adjustment term at the same time that the IPP is being produced, however, reduces the quantity of historical data that can be used to determine the temporary savings in Year 3. This could potentially lead to greater error/reduced accuracy in the model. We are going to leave the option open for us to determine at a later date if necessary.

Attachment A: IPP forecast assumptions

98. The following screenshots are from the IRIS spreadsheet, published alongside our draft decision, which demonstrate how the mechanism functions.[63] The following examples demonstrate the impact of a $10 permanent saving under differing IPP assumptions.

99. Figure 3 demonstrates the effect of the permanent saving with the current assumption in the Transpower IRIS IM that the IPP forecast includes Year 4 permanent savings. Consumers gain from the lower IPP forecast in RCP2. Transpower gains for two years in RCP1 and from the carry over amounts included for four years (in Years 6 to 9) in the opex incentive amount recovered in RCP2. The retention (sharing) factor is 34%.

Figure 3 – IPP forecast includes Year 4 permanent savings

	IPP regulatory period 1					IPP regulatory period 2					
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11
Forecast	**100**	**100**	**100**	**100**	**100**	**90**	**90**	**90**	**90**	**90**	**90**
Permanent saving	-	-	-	**10**	-	-	-	-	-	-	-
Temporary saving	-	-	-	-	-	-	-	-	-	-	-
Actual opex (with saving)	**100**	**100**	**100**	**90**	**90**	**90**	**90**	**90**	**90**	**90**	**90**
Incremental change	-	-	-	**10**	-	**-10**	-	-	-	-	-
Carry forward terms											
Amount carried forward in the first disclosure year (cl 3.3.6(2))	-					-					-
Amount carried forward in all but the first or last disclosure years (cl 3.6.3(3))		-	-	*10*			-	-	-		
Amount carried forward in the last disclosure year (cl 3.6.3(4))					*0*					-	
Equivalent adjustment terms carried forward											
Equivalent of base year adjustment term						-					-
Equivalent of base line adjustment term					-	-					
Annual incremental changes	-	-	-	*10*	-	-	-	-	-	-	-
Amounts carried forward to opex incentive amount (cl 3.6.2)						***10***	***10***	***10***	***10***	-	-
Saving in opex	-	-	-	10	10	-	-	-	-	-	-
Benefit for consumers (lower prices)	-	-	-	-	-	-10	-10	-10	-10	-	-
Benefit to supplier (higher cash flow)	-	-	-	10	10	10	10	10	10	-	-

Net Present Value of permanent savings	$121.0
Net Present Value of temporary savings	-
Net Present Value of total savings	$121.0
Net Present Value of savings to the supplier	$41.2
Sharing factor for the supplier	**34%**

100. Figure 4 demonstrates the effect of the permanent saving with the assumption that the IPP excludes Year 4 permanent savings, but there is no adjustment to the current Transpower IRIS IM. As Transpower generates its IPP forecast in Year 3 of the regulatory period, Year 4 savings will not be included in the forecast. Here, Transpower gains twice. It retains the opex incentive amount, but also gains from the fact that the IPP forecast includes an additional $10 each year over its actual opex amount. This additional reward results in a retention factor of 64% for Transpower.

63 Commerce Commission "Transpower IRIS baseline adjustment demonstration model" (24 March 2017).

101. In the examples in both Figure 1 and 2, the current assumptions mean that there is no baseline adjustment term (as there are only permanent savings – not temporary savings).[64]

Figure 4 – IPP forecast excludes Year 4 permanent savings

	IPP regulatory period 1					IPP regulatory period 2					
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11
Forecast	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**90**
Permanent saving	-	-	-	**10**	-	-	-	-	-	-	-
Temporary saving	-	-	-	-	-	-	-	-	-	-	-
Actual opex (with saving)	**100**	**100**	**100**	**90**	**90**	**90**	**90**	**90**	**90**	**90**	**90**
Incremental change	-	-	-	**10**	-	-	-	-	-	-	**-10**
Carry forward terms											
Amount carried forward in the first disclosure year (cl 3.3.6(2))	-					*10*					-
Amount carried forward in all but the first or last disclosure years (cl 3.6.3(3))		-	-	*10*			-	-	-		
Amount carried forward in the last disclosure year (cl 3.6.3(4))					*0*					-	
Equivalent adjustment terms carried forward											
Equivalent of base year adjustment term						-					-
Equivalent of base line adjustment term					-	-					
Annual incremental changes	-	-	-	*10*	-	*10*	-	-	-	-	-
Amounts carried forward to opex incentive amount (cl 3.6.2)						***10***	***10***	***10***	***10***	***-***	***10***
Saving in opex	-	-	-	10	10	10	10	10	10	10	10
Benefit for consumers (lower prices)	-	-	-	-	-	-10	-10	-10	-10	-	-
Benefit to supplier (higher cash flow)	-	-	-	10	10	20	20	20	20	10	10

Net Present Value of permanent savings	$121.0
Net Present Value of temporary savings	-
Net Present Value of total savings	$121.0
Net Present Value of savings to the supplier	$77.1
Sharing factor for the supplier	**64%**

102. Figure 5 demonstrates the effect of the permanent saving with the assumption that the IPP forecast excludes Year 4 permanent savings, with an adjustment to the IRIS detailed in paragraph 47. The adjusted baseline adjustment term incorporates total savings in Year 4, and acts to counteract any amounts that would otherwise have been carried forward from Year 4 as part of the opex incentive. The retention factor for Transpower reverts to the correct value of 34%.

64 In the current IMs, a baseline adjustment term is determined by the value of temporary savings in Year 4 of the regulatory period.

Figure 5 – IPP forecast excludes Year 4 permanent savings, IRIS adjusted

	IPP regulatory period 1					IPP regulatory period 2					
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11
Forecast	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**90**
Permanent saving	**-**	**-**	**-**	**10**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Temporary saving	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Actual opex (with saving)	**100**	**100**	**100**	**90**	**90**	**90**	**90**	**90**	**90**	**90**	**90**
Incremental change	**-**	**-**	**-**	**10**	**-**	**-**	**-**	**-**	**-**	**-**	**-10**
Carry forward terms											
Amount carried forward in the first disclosure year (cl 3.3.6(2))	-					*10*					-
Amount carried forward in all but the first or last disclosure years (cl 3.6.3(3))		-	-	*10*			-	-	-		
Amount carried forward in the last disclosure year (cl 3.6.3(4))					*0*					-	
Equivalent adjustment terms carried forward											
Equivalent of base year adjustment term						-					-
Equivalent of base line adjustment term					*-10*	*-10*					
Annual incremental changes	-	-	-	*10*	*-10*	-	-	-	-	-	-
Amounts carried forward to opex incentive amount (cl 3.6.2)						-	-	-	-	***-10***	-
Saving in opex	-	-	-	10	10	10	10	10	10	10	10
Benefit for consumers (lower prices)	-	-	-	-	-	-	-	-	-	10	10
Benefit to supplier (higher cash flow)	-	-	-	10	10	10	10	10	10	-	-

Net Present Value of permanent savings	$121.0
Net Present Value of temporary savings	-
Net Present Value of total savings	$121.0
Net Present Value of savings to the supplier	$41.2
Sharing factor for the supplier	**34%**

Attachment B: Transpower IRIS IM drafting

Change to cl 3.6.4 (3)

The 'baseline adjustment term' is calculated in accordance with the formula–

~~*non-recurrent*~~ *differences in penultimate year*

×

$((1-(1+WACC)^{-6})/WACC)$

×

$(1+WACC)^{2}$

Where –

~~non-recurrent~~ differences in penultimate year means the amount calculated in accordance with subclause (4)

Change to cl 3.6.4 (4)

~~'non-recurrent differences in penultimate year' is an amount determined by the Commission, having regard to the views of interested persons, attributable to the impact of non-recurrent factors which cause differences between forecast opex and actual opex in the penultimate disclosure year of the preceding regulatory period, and notified to Transpower.~~

'Differences in penultimate year' is an amount determined by the Commission, having regard to the views of interested persons, that is the difference between forecast opex and actual opex in the penultimate year of the preceding regulatory period, minus any amount resulting from savings that occurred in the preceding years of the regulatory period. For the purpose of this definition, savings can be both negative and positive. The amount so determined is to be notified to Transpower.

Attachment C: Determining 'differences in penultimate year'

103. The Transpower IRIS IM requires us to estimate 'differences in penultimate year'.[65] This term is determined by calculating the difference between forecast and actual opex in the penultimate year (Year 4) and subtracting any savings that were made in previous years (Years 1-3).[66]

104. Any savings made in Years 1-3 which still apply in Year 4 can be considered as permanent (or recurrent). These permanent savings can be calculated as the difference between forecast and actual opex in Year 3, and an estimate of temporary savings in Year 3.

105. For example:

$$\textit{Differences in penultimate year} = \textit{Total saving}_{Y4}$$

$$\textit{Total saving}_{Y4} = (\textit{Forecast opex} - \textit{Actual opex})_{Y4} - \textit{Perm saving}_{Y1\text{-}3}$$

$$\textit{Perm saving}_{Y1\text{-}3} = (\textit{Forecast opex} - \textit{Actual opex})_{Y3} - \textit{Temp saving}_{Y3}$$

106. Therefore:

$$\textit{Differences in penultimate year} =$$

$$(\textit{Forecast opex} - \textit{Actual opex})_{Y4} - (\textit{Forecast opex} - \textit{Actual opex})_{Y3} + \textit{Temp saving}_{Y3}$$

107. Forecast opex and actual opex will be known for Years 3 and 4. Therefore to determine the 'differences in penultimate year' an estimate of temporary savings in Year 3 will be required. Chapter 4 explains the potential methodologies which we propose to use to determine this estimate.

[65] 'Differences in penultimate year' can also be considered as the total (ie, both permanent and temporary) savings made in the penultimate year.

[66] The penultimate year will be Year 4 for a 5-year IPP.

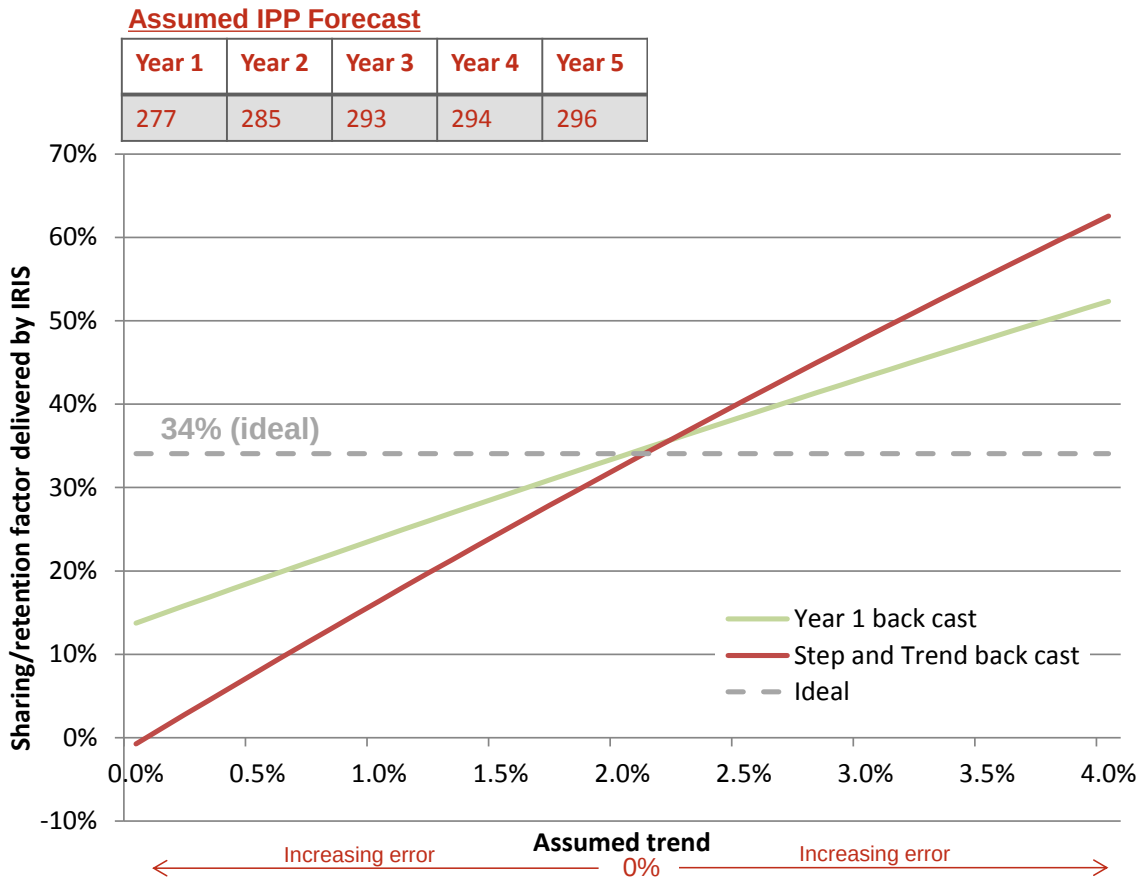
Attachment D: Input assumption error when estimating temporary savings

108. Chapter 4 outlined our two methods for estimating temporary savings in opex. As previously noted, the most appropriate method will depend on how representative Year 1 of the IPP forecast is compared to the rest of the IPP forecast.

109. Figure 6 presents a scenario in which the actual opex trend is 2% and Year 1 of the IPP forecast is broadly consistent with the rest of the years in the IPP.[67] The graph shows that when we assume the opex trend is 2%, the input error is zero and the achieved retention (or sharing) factor through the IRIS is very close to the ideal 34% applied to the IRIS in RCP2.

110. However, the graph also shows that as the assumed trend diverges from actual trend, the error increases more quickly under the Step and Trend back cast, compared to the Year 1 back cast. Under this scenario, the Year 1 back cast results in a more appropriate estimate that is less prone to an error in our trend assumption.

Figure 6 – Relationship between increasing error in the trend assumption and error in IRIS retention factor



[67] For the purposes of this comparison, no permanent 'step' is made as it affects both methods equally.

111. Figure 7 and 8 show similar graphs but this time the Year 1 forecast in the IPP is either particularly high or particularly low. Under these circumstances, the Year 1 back cast approach may result in a significant estimation error that outweighs the impact from the trend assumption.

Figure 7 – Relationship between increasing error in the trend assumption and error in IRIS retention factor (High Year 1 IPP forecast)

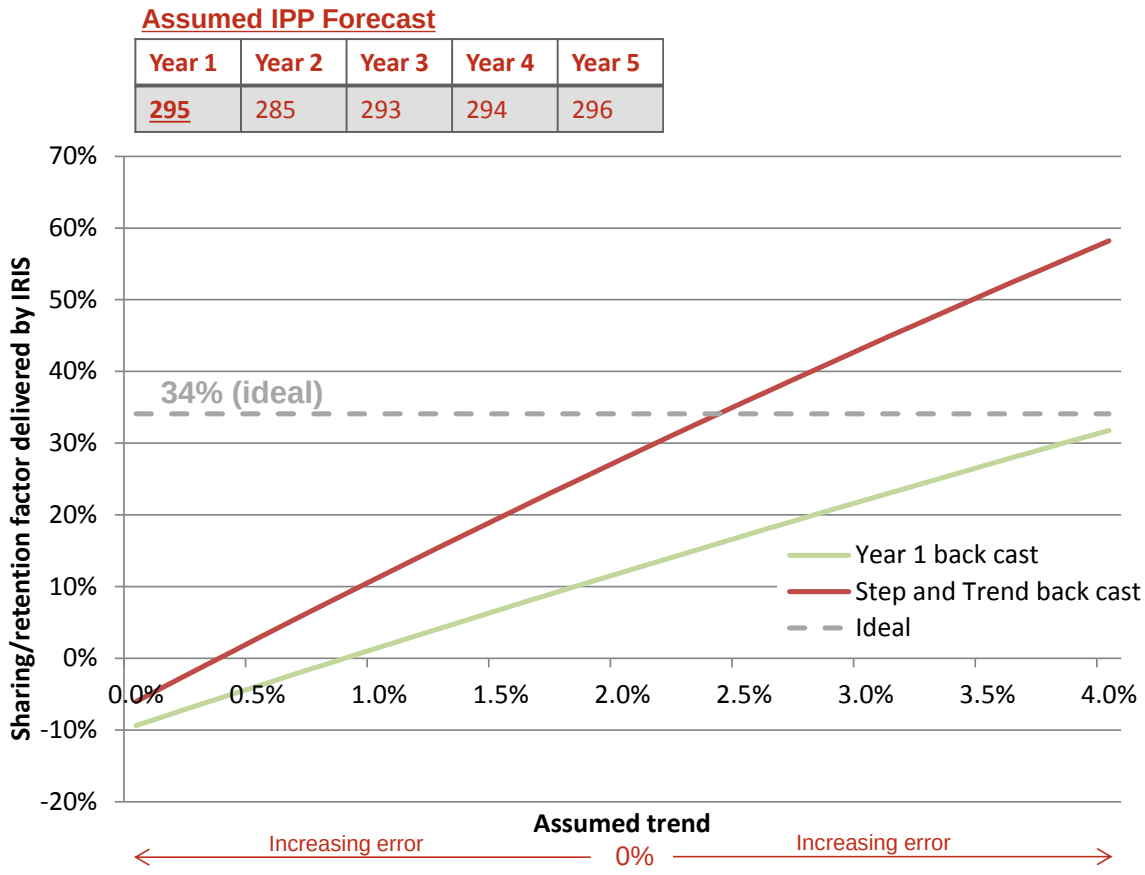


Figure 8 – Relationship between increasing error in the trend assumption and error in IRIS retention factor (Low Year 1 IPP forecast)