



Staff Paper

Project **Emissions Trading Schemes**

Topic **Quantitative Examples**

Purpose

1. This paper includes quantitative examples and accompanies IASB Agenda Papers 5A and 5B/FASB Agenda Papers 7A and 7B. Papers 5A/7A and 5B/7B analyze the initial and subsequent measurement of allowances and the liabilities in a cap and trade scheme. This paper illustrates the possible impact of the staff's recommendations and alternatives set out in the Papers 5A/7A and 5B/7B on an entity's financial statement.
2. The examples are not intended to provide balance sheet or income statement presentation guidance, or preempt the boards' discussion on measurement. The issues of presentation, disclosure and netting of the allowances and the emission liabilities will be discussed at a future board meeting.

Examples

3. The examples (Appendix A) illustrate the financial statement impact for two companies—Company A and Company B. Many of the assumptions are the same for Company A and Company B, including the quantity (number) of allocated allowances, the commitment and compliance periods, and the price movements in the allowances. The only difference between the fact pattern for Companies A and B is the level of expected and actual emissions of the companies. Specifically, Company A will be required to purchase additional allowances (in excess of its allocation) because it has emissions in excess of the

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liability for the allocation. Company B will have excess allocated allowances because it emits less than its liability for the allocation.

4. In IASB Agenda Paper 5A/FASB Agenda Paper 7A, the staff described possible models for determining both the price of the allowances¹ and the quantity of allowances to be returned². The price of allowances and the quantity of allowances to be returned are inputs for measuring the liability for the allocation.
5. For simplicity, the examples will only illustrate the differences in the pricing models for measuring the allowances and the emission-related liabilities. The probability-weighted approach is the only quantity model utilized in the examples. The staff observe that the alternative quantity models to determine the quantity of allowances to be returned may only vary because of differences in facts and circumstances for individual entities, and judgments made in applying those models. The staff believe that illustrating the effect of price changes is more relevant for understanding the particular measurement models outlined in IASB Agenda Paper 5A/FASB Agenda Paper 7A.

General conditions and assumptions

6. Both companies in the examples participate in a cap & trade emissions trading scheme.
7. Allowances are allocated on 1/1/Y1. Company A and Company B each receive a single allocation of 150 allowances that can be used over a three-year commitment period. Both companies settle their annual obligation for the prior years' emissions on January 1st.
8. Price changes for the allowances are the same throughout the period for both entities, and those price changes are included as Appendix B.

¹ Price models include the fair value with remeasurement, fair value with no remeasurement, price paid with no remeasurement, and business models.

² Quantity models include the expected value (ie probability-weighted), virtually certain, and more-likely-than-not models.

Company A

9. Company A expects to emit more units of emissions than the level of allowances allocated. Therefore, it will expect to return the full quantity of allowances allocated (to settle the liability for the allocation) at the end of each compliance period.
10. Company A's actual emissions are 60 units per year, at a constant rate, for each of the three years of the scheme. (A total of 180 units for the three year commitment period).
11. Company A purchases additional allowances at the end of the three year commitment period, when they emit beyond the level of the allocation. Company A purchases 30 allowances (180 units emitted minus 150 allowances allocated).

Company B

12. Company B expects to emit fewer units of emissions than the level of allowances allocated. Consequently, Company B calculates its expected quantity of allocated allowances to be returned (to settle the liability for the allocation) using a probability-weighted approach. Company B's probability-weighted assessment used in the probability-weighted approach is included as Appendix C. The probability-weighted assessment depicts three possible emission levels and related probabilities that are updated at the end of each compliance period.
13. Company B's actual emissions are 40 units per year, at a constant rate, for each of the three years of the scheme. (A total of 120 units for the three year commitment period).
14. Company B sells its excess allowances at the end of the three year commitment period. Company B sells 30 allowances (150 allowances allocated minus 120 units emitted).

Models – A short description

Company A³

Model 1 (i): Fair Value with Remeasurement (probability-weighted) [Staff recommendation]

15. Model 1 (i) demonstrates the staff recommendation of initial and subsequent measurement for the allowances (purchased and allocated) and the liability for the allocation at fair value for both companies.
16. Under the staff recommendation, Company A recognizes the allocated allowances at fair value at the allocation date. The liability for the allocation is also measured at fair value, resulting in no income statement effect at initial recognition because Company A expects to return all of its allocated allowances. (This is also true for Company A for the other models.)
17. The allocated allowances and the liability for the allocation are remeasured to fair value at the end of each reporting period (calendar year for the purposes of the examples). Given that Company A holds enough allocated allowances to cover the liability for the allocation (throughout the commitment period), remeasuring does not impact earnings (profit and loss). The staff observe however, that if Company A sells its allocated allowances and does not immediately replace them, earnings would be affected because the liability for the allocation is remeasured to fair value⁴. For simplicity, this scenario was not included in the examples.
18. In the third compliance period, Company A emits beyond its allocation and recognizes a liability for its excess emissions. At the end of the third

³ The probability-weighted approach does not impact Company A as it expects to use all of the allocated allowances.

⁴ Because the liability for the allocation and the allocated allowances are remeasured to fair value, when the quantity of one element exceeds the other (ie the entity expects to return more allocated allowances (liability) than it holds (assets)), remeasuring to fair value will cause volatility in earnings (profit and loss). Essentially, if Company A were to sell allocated allowances, Company A will be exposed to variances in the price of the allowances for the quantity of allowances it expects to return (the liability for the allocation).

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compliance period, Company A purchases the allowances it needs to satisfy its obligation to return one allowance for each unit of emissions⁵.

Model 1 (ii): Fair Value with No Remeasurement

19. Model 1 (ii) presents initial measurement of the assets (purchased and allocated) and the liability for the allocation at fair value, but does not (normally)⁶ require remeasurement.
20. In the third compliance period, Company A emits beyond its allocation and recognizes a liability for the excess emissions. This liability is initially and subsequently measured at the fair value of the additional allowances that must be provided to the scheme administrator. The purchased allowances to cover this liability are measured at fair value at the date of purchase⁷.

Model 2: Price Paid with No Remeasurement

21. Model 2 recognizes the allocated allowances and liability for the allocation at the allocation date, however the measurement of both would be NIL— which is the price paid by the entity at acquisition. The allowances are not subsequently remeasured.
22. A portion of the liability could potentially be required to be remeasured at fair value if the entity enters into a short position by selling allocated allowances it expects to return due to emissions. This would expose the company to earnings

⁵ If Company A did not immediately purchase allowances to cover its excess emissions, earnings would be affected for the remeasurement (to fair value) of the liability for the excess emissions. The staff did not include this scenario in the examples for simplicity.

⁶ The models that do not normally require remeasurement of the asset or liability for the allocation may require the liability to be remeasured in some circumstances. For example, if an entity emits beyond its held allowances, or sells allocated allowances that will be needed to return to the scheme administrator to settle the liability for the allocation. In both cases, the entity has a liability that is not covered by allowances. Thus the entity will be exposed to price variations in the allowance market and the liability would need to be measured to the price of the allowances the entity would need to purchase to settle the liability (the fair value of the allowances). This exposure will introduce volatility in earnings, and risk to price variances in the allowances market.

⁷ In the examples, the staff only provide fair value measurements on an yearly disaggregation. As such, it is assumed there will not be price variations between the time of emissions and purchase of allowances (within a single year, or in the case of the examples, year 3).

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(profit and loss) volatility by the value of the liability for the allocation no longer covered by held allowances.

23. In the third compliance period, Company A emits beyond its allocation and recognizes a liability for the excess emissions. This liability (for excess emissions) is initially and subsequently measured at the fair value of the additional allowances that must be provided to the scheme administrator. The purchased allowances to cover this liability are measured at the price paid.

Model 3: Business Model

24. A business model approach would recognize:
 - a. allowances held for trading at fair value with remeasurement, and
 - b. allowances held for use in an emissions trading scheme at the price paid (ie NIL), without remeasurement.
25. Since Company A's intention is to remit all of its allocated allowances (plus some that were purchased) to the scheme administrator, the allocated allowances and liability for the allocation are measured at price paid (ie NIL).
26. In the third compliance period, Company A emits beyond the amount of allocated allowances, which results in recording a liability for the excess emissions. Company A purchases (additional) allowances to cover this liability in the third compliance period. As with the models above, these allowances are measured at the price paid.
27. As noted in IASB Agenda Paper 5A/FASB Agenda Paper 7A, the staff has not fully developed the business model and will bring this model back to the boards for further consideration if the boards prefer this approach. This approach may require further analysis. For example, under this approach it is not clear what Company A would do if it were to sell its allocated allowances at the beginning of the compliance period with the intent of buying them back at the end of the compliance period. The staff has made simplifying assumptions about how the business model might be applied in these examples.

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Company B

Model 1 (i): Fair Value with Remeasurement (probability-weighted) [Staff recommendation]

28. This section also demonstrates the staff recommendation of initial and subsequent measurement for the allowances (purchased and allocated) and the liability for the allocation at fair value.
29. Furthermore, the example illustrates the staff's recommended method for calculating the quantity of allowances expected to be returned to settle the liability for the allocation—*expected outcome (ie probability-weighted expected outcome)*. (This is true for Company B in all the models.)
30. In addition, because Company B expects to return fewer allowances than it has been allocated, a gain is recognized at the allocation date ('Day 1 gain'). (This is also true for Model 1(ii) and Model 3 below.)
31. No liability for excess emissions is recorded for Company B because it does not emit beyond the allocated allowances. (This is also true for Company B in other models.)

Model 1 (ii): Fair Value with No Remeasurement

32. Model 1 (ii) presents initial measurement of the assets (purchased and allocated) and the liability for the allocation at fair value, but does not (normally)⁸ require remeasurement.
33. No liability for excess emissions is recorded for Company B because it does not emit beyond the allocated allowances.

⁸ The models that do not normally require remeasurement of the asset or liability for the allocation, may require the liability to be remeasured in some circumstances. For example, if an entity emits beyond its held allowances, or sells allocated allowances that will be needed to return to the scheme administrator to settle the liability for the allocation. In both cases, the entity has a liability that is not covered by allowances. Thus the entity will be exposed to price variations in the allowance market and the liability would need to be measured to the price of the allowances the entity would need to purchase to settle the liability (the fair value of the allowances). This exposure will introduce volatility in earnings, and risk to price variances in the allowances market.

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Model 2: Price Paid with No Remeasurement

34. Model 2 recognizes the asset and liability for the allocation when the allowances are allocated, however the measurement of both the allocated allowances and the liability for the allocation would be NIL—the price paid by the entity at acquisition. Neither the allowances nor the liability for the allocation are remeasured. The portion of the held allocated allowances for which the entity has reduced emissions would not be remeasured.
35. In the third compliance period, Company A sells its excess allocated allowances and recognizes a gain for the sale.

Model 3: Business Model

36. This model includes the same assumptions about the business model as Company A, described in paragraphs 24-27 above. However, since Company B has been allocated more allowances than it expects to return, the liability for the allocation will be calculated based upon a probability-weighted assessment. Furthermore, because Company B will not need all of its allocated allowances, its intent is to ‘trade’ those excess allowances. Thus, the excess allowances are classified as trading and measured (and remeasured) at fair value, ie the same measurement as under the fair value with remeasurement model.

Summary

37. The examples illustrate the financial statement differences that result from utilizing the possible measurement models discussed in IASB Agenda Paper 5A/FASB Agenda Paper 7A and the staff’s assumptions for the quantity of allowances expected to be returned. Generally, the examples illustrate the following financial statement impact for each measurement model:
 - a. Fair value with remeasurement –annual earnings is impacted by changes in both the price of allowances and the quantity of allowances expected to be returned.
 - b. Fair value with no remeasurement –annual earnings is only impacted by changes in the quantity of allowances expected to be returned.

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- c. Price paid – annual earnings are not impacted until an entity emits beyond its allocation and must therefore purchase additional allowances, or an entity sells allocated allowances.
- d. Business – if a trading model is utilized then earnings is impacted by changes in both the price of allowances and the quantity of allowances expected to be returned. If a held-for-use model is utilized then earnings is only impacted by changes in the quantity of allowances expected to be returned.

Appendix A: Examples

	Company A			
	Model 1		Model 2	Model 3
	Fair Value with Remeasurement <i>Probability-Weighted</i> [Staff Recommendation]	Fair Value with No Remeasurement <i>Probability-Weighted</i>	Price Paid <i>Probability-Weighted</i>	Business Model <i>Probability-Weighted</i>
January 1 Year 1				
Allocated Allowances	150	150	150	150
Balance Sheet				
Allowances: Allocated	4,500.00	4,500.00	-	-
Allowances: Purchased	-	-	-	-
Liability for the Allocation	(4,500.00)	(4,500.00)	-	-
Liability for Excess Emissions Retained (earnings)/deficit	-	-	-	-
<i>Net emissions position</i>	-	-	-	-
Income Statement				
Gain / (Loss) at Allocation	-	-	-	-
December 31 Year 1				
Purchased Allowances this Period				
Allocated Allowances (end of period)	150	150	150	150
Emissions	60	60	60	60
Balance Sheet				
Cash	-	-	-	-
Allowances: allocated	4,800.00	4,500.00	-	-
Allowances: purchased	-	-	-	-
Liability for the Allocation	(4,800.00)	(4,500.00)	-	-
Liability for Excess Emissions Retained (earnings)/deficit	-	-	-	-
<i>Net emissions position</i>	-	-	-	-
Income Statement				
Gain / (Loss)	-	-	-	-
Net Income (loss)	-	-	-	-

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	Company A			
	Model 1		Model 2	Model 3
	Fair Value with Remeasurement	Fair Value with No Remeasurement	Price Paid	Business Model
	<i>Probability-Weighted</i> [Staff Recommendation]	<i>Probability-Weighted</i>	<i>Probability-Weighted</i>	<i>Probability-Weighted</i>
December 31 Year 2				
Purchased Allowances this Period				
Allocated Allowances (end of period)	90	90	90	90
Emissions	60	60	60	60
Balance Sheet				
Cash	-	-	-	-
Allowances: allocated	2,520.00	2,700.00	-	-
Allowances: purchased	-	-	-	-
Liability for the Allocation	(2,520.00)	(2,700.00)	-	-
Liability for Excess Emissions	-	-	-	-
Retained (earnings)/deficit	-	-	-	-
<i>Net emissions position</i>	-	-	-	-
Income Statement				
Gain / (Loss)	-	-	-	-
Net Income (loss)	-	-	-	-
December 31 Year 3				
Purchased Allowances this Period	30	30	30	30
Allocated Allowances (end of period)	30	30	30	30
Emissions	60	60	60	60
Balance Sheet				
Cash	(1,020.00)	(1,020.00)	(1,020.00)	(1,020.00)
Allowances: allocated	1,020.00	900.00	-	-
Allowances: purchased	1,020.00	1,020.00	1,020.00	1,020.00
Liability for the Allocation	(1,020.00)	(900.00)	-	-
Liability for Excess Emissions	(1,020.00)	(1,020.00)	(1,020.00)	(1,020.00)
Retained (earnings)/deficit	1,020.00	1,020.00	1,020.00	1,020.00
<i>Net emissions position</i>	-	-	-	-
Income Statement				
Purchase of Allowances (Expense)	(1,020.00)	(1,020.00)	(1,020.00)	(1,020.00)
Gain / (Loss)	-	-	-	-
Net income (loss)	(1,020.00)	(1,020.00)	(1,020.00)	(1,020.00)
Cumulative for the three year commitment period				
Income Statement				
Gain / (Loss) at Allocation	-	-	-	-
Gain / (Loss) on Purchase	(1,020.00)	(1,020.00)	(1,020.00)	(1,020.00)
Gain / (Loss)	-	-	-	-
Net Income (loss)	(1,020.00)	(1,020.00)	(1,020.00)	(1,020.00)

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	Company B			
	Model 1		Model 2	Model 3
	Fair Value with Remeasurement <i>Probability-Weighted</i> [Staff Recommendation]	Fair Value with No Remeasurement <i>Probability-Weighted</i>	Price Paid <i>Probability-Weighted</i>	Business Model <i>Probability-Weighted</i>
January 1 Year 1				
Allocated Allowances	150	150	150	150
Balance Sheet				
Allowances: Allocated	4,500.00	4,500.00	-	697.50
Allowances: Purchased	-	-	-	-
Liability for the Allocation	(3,802.50)	(3,802.50)	-	-
Liability for Excess Emissions Retained (earnings)/deficit	(697.50)	(697.50)	-	(697.50)
<i>Net emissions position</i>	697.50	697.50	-	697.50
Income Statement				
Gain / (Loss) at Allocation	697.50	697.50	-	697.50
December 31 Year 1				
Sold Allowances this Period				
Allocated Allowances (end of period)	150	150	150	150
Emissions	40	40	40	40
Balance Sheet				
Cash	-	-	-	-
Allowances: allocated	4,800.00	4,500.00	-	864.00
Allowances: purchased	-	-	-	-
Liability for the Allocation	(3,936.00)	(3,690.00)	-	-
Liability for Excess Emissions Retained (earnings)/deficit	(864.00)	(810.00)	-	(864.00)
<i>Net emissions position</i>	864.00	810.00	-	864.00
Income Statement				
Gain / (Loss)	166.50	112.50	-	166.50
Net Income (loss)	166.50	112.50	-	166.50

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	Company B			
	Model 1		Model 2	Model 3
	Fair Value with Remeasurement	Fair Value with No Remeasurement	Price Paid	Business Model
	<i>Probability-Weighted</i> [Staff Recommendation]	<i>Probability-Weighted</i>	<i>Probability-Weighted</i>	<i>Probability-Weighted</i>
December 31 Year 2				
Sold Allowances this Period				
Allocated Allowances (end of period)	110	110	110	110
Emissions	40	40	40	40
Balance Sheet				
Cash	-	-	-	-
Allowances: allocated	3,080.00	3,300.00	-	840.00
Allowances: purchased	-	-	-	-
Liability for the Allocation	(2,240.00)	(2,400.00)	-	-
Liability for Excess Emissions	-	-	-	-
Retained (earnings)/deficit	(840.00)	(900.00)	-	(840.00)
<i>Net emissions position</i>	<i>840.00</i>	<i>900.00</i>	-	<i>840.00</i>
Income Statement				
Gain / (Loss)	(24.00)	90.00	-	(24.00)
Net Income (loss)	(24.00)	90.00	-	(24.00)
December 31 Year 3				
Sold Allowances this Period	30	30	30	30
Allocated Allowances (end of period)	40	40	40	40
Emissions	40	40	40	40
Balance Sheet				
Cash	1,020.00	1,020.00	1,020.00	1,020.00
Allowances: allocated	1,360.00	1,200.00	-	-
Allowances: purchased	-	-	-	-
Liability for the Allocation	(1,360.00)	(1,200.00)	-	-
Liability for Excess Emissions	-	-	-	-
Retained (earnings)/deficit	(1,020.00)	(1,020.00)	(1,020.00)	(1,020.00)
<i>Net emissions position</i>	-	-	-	-
Income Statement				
Gain on Sale of Allowances	-	120.00	1,020.00	-
Gain / (Loss)	180.00	-	-	180.00
Net income (loss)	180.00	120.00	1,020.00	180.00
Cumulative for the three year commitment period				
Income Statement				
Gain / (Loss) at Allocation	697.50	697.50	-	697.50
Gain / (Loss) on Sale	-	120.00	1,020.00	-
Gain / (Loss)	322.50	202.50	-	322.50
Net Income (loss)	1,020.00	1,020.00	1,020.00	1,020.00

Appendix B: Price changes

The following table displays the assumed price changes for emissions allowances over the compliance period.

Date	Price
January 1, Y1	30
December 31, Y1	32
December 31, Y2	28
December 31, Y3	34

Appendix C: Probability-weighted assessment for Company B

The following table displays the assumed probability-weighted assessment for Company B for each year.

Date Estimate Made	Scenario 1: Expect to return 40 allowances	Scenario 2: Expect to return 50 allowances	Scenario 3: Expect to return 35 allowances	Probability weighted average of allowances expected to be returned for remaining years
January 1, Y1	70%	25%	5%	42.25
December 31, Y1	85%	15%	0%	41.5
December 31, Y2	100%	0%	0%	40