
IASB[®] meeting

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Project	Power Purchase Agreements (PPAs)	
Topic	Proposed amendments to the hedge-accounting requirements	
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Purpose and structure

1. This paper provides a staff analysis and staff recommendations to amend the hedge-accounting requirements of IFRS 9 *Financial Instruments* with respect to a narrow population of contracts for renewable electricity with particular characteristics as set out in Agenda Paper 3A for this meeting.
2. The purpose of this paper is to provide the staff analysis and ask if the IASB agrees with the staff recommendations on the proposed amendments to the hedge-accounting requirements as applied to the use of contracts for renewable electricity as hedging instruments in a cash flow hedging relationship.
3. This paper provides a summary of:
 - (a) [staff recommendations and questions](#) for the IASB
 - (b) [staff analysis of proposed amendments](#) with respect to hedge accounting;
 - (i) [applying the hedge-accounting requirements](#) in IFRS 9;
 - (ii) [hedging forecasted sales of renewable electricity](#); and
 - (iii) [hedging forecasted purchases of renewable electricity](#);
 - (c) [staff conclusions and recommendations](#).

4. We have provided an illustrative example how to apply the proposed amendments in [Appendix A](#).

Summary of staff recommendations and questions for the IASB

5. Based on the findings of the research and other input received from stakeholders and our analysis in paragraphs 5–78 we recommend that, when designating a cash flow hedging relationship in which a contract for renewable electricity (as described in Agenda Paper 3A paragraph 29) is designated as a hedging instrument, an entity is permitted to designate as the hedged item a variable nominal volume/quantity of forecasted sales or purchases of renewable electricity if, and only if:
- (a) the volume of the hedged item designated is specified as a proportion of the variable volume of the hedging instrument.
 - (b) the hedged item is measured using the same volume assumptions as those used for the hedging instrument. However, all other assumptions used for measuring the hedged item, are reflective of the nature of the hedged item and not imputing the features of the hedging instrument (for example the pricing structure).
 - (c) the designated forecasted sales or purchases of electricity are:
 - (i) for a purchaser, highly probable if the entity has sufficient highly probable capacity that exceeds the estimated variable volume/quantity to be designated in the hedged item; or
 - (ii) for a seller, not required to be highly probable because the designated quantity of sales is certain to occur once produced.

Question for the IASB

Does the IASB agree with our recommendation in paragraph 5?

Staff analysis of proposed amendments to the hedge-accounting requirements of IFRS 9

Applying the hedge-accounting requirements in IFRS 9

6. To qualify for a hedging relationship under IFRS 9 the hedging relationship must meet all of the following criteria (paragraph 6.4.1 of IFRS 9):
 - (a) the hedging relationship consist only of eligible hedging instrument(s) (paragraphs 6.2.1–6.2.3 and 6.4.1(a) of IFRS 9 and eligible hedged item(s) (paragraphs 6.3.1–6.3.6 and 6.4.1(a) of IFRS 9);
 - (b) at the inception of the hedging relationship there is a formal designation [...] (paragraph 6.4.1(b)); and
 - (c) the hedging relationship meet all of the hedge effectiveness requirements (paragraph 6.4.1 (c) of IFRS 9.

The hedged item

7. A hedged item can be a recognised asset or liability, an unrecognised firm commitment, a forecast transaction or a net investment in a foreign operation (see paragraph 6.3.1 of IFRS 9).
8. The hedged item must be reliably measurable (paragraph 6.3.2 of IFRS 9) and if a hedged item is a forecast transaction (or a component thereof), that transaction must be highly probable (paragraph 6.3.3 of IFRS 9).
9. Paragraph 6.3.7 of IFRS 9 states that an entity may designate an item in its entirety or a component of an item as the hedged item in a hedging relationship. An entire item comprises all changes in the cash flows or fair value of an item. A component comprises less than the entire fair value change or cash flow variability of an item. In that case, an entity may designate only the following types of components (including combinations) as hedged items:

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- (a) only changes in the cash flows or fair value of an item attributable to a specific risk or risks (risk component), provided that, based on an assessment within the context of the particular market structure, the risk component is separately identifiable and reliably measurable (see paragraphs B6.3.8–B6.3.15 of IFRS 9). Risk components include a designation of only changes in the cash flows or the fair value of a hedged item above or below a specified price or other variable (a one-sided risk).
 - (b) one or more selected contractual cash flows.
 - (c) components of a nominal amount, ie a specified part of the amount of an item (see paragraphs B6.3.16–B6.3.20 of IFRS 9).

10. Paragraph B6.3.16 of IFRS 9 further states:

There are two types of components of nominal amounts that can be designated as the hedged item in a hedging relationship: a component that is a proportion of an entire item or a layer component. The type of component changes the accounting outcome. An entity shall designate the component for accounting purposes consistently with its risk management objective.

11. The designation of a layer component is described in paragraph B6.3.18 of IFRS 9:

A layer component may be specified from a defined, but open, population, or from a defined nominal amount. Examples include:

- (a) part of a monetary transaction volume, for example, the next FC10 cash flows from sales denominated in a foreign currency after the first FC20 in March 201X;
- (b) a part of a physical volume, for example, the bottom layer, measuring 5 million cubic metres, of the natural gas stored in location XYZ;

(c) a part of a physical or other transaction volume, for example, the first 100 barrels of the oil purchases in June 201X or the first 100 MWh of electricity sales in June 201X; or

(d) a layer from the nominal amount of the hedged item, for example, the last CU80 million of a CU100 million firm commitment, the bottom layer of CU20 million of a CU100 million fixed-rate bond or the top layer of CU30 million from a total amount of CU100 million of fixed-rate debt that can be prepaid at fair value (the defined nominal amount is CU100 million).

The hedging instrument

12. A derivative measured at fair value through profit or loss may be designated as a qualifying hedging instrument, except for some written options (paragraph 6.2.1 of IFRS 9)
13. A qualifying instrument must be designated in its entirety as a hedging instrument apart from some exceptions (for example a proportion of the nominal such a 50 per cent may be designated. However, a hedging instrument may not be designated for a part of its change in fair value that results from only a portion of the time period during which the hedging instrument remains outstanding, commonly known as ‘partial term hedging’ (see paragraph 6.2.4 of IFRS 9).

The economic relationship

14. Paragraph B6.4.4 clarifies the economic relationship by stating that:

[...] means that the hedging instrument and the hedged item have values that generally move in the opposite direction because of the same risk, which is the hedged risk. Hence, there must be an expectation that the value of the hedging instrument and the value of the hedged item will systematically change in response to movements in either the same underlying or underlyings that are

economically related in such a way that they respond in a similar way to the risk that is being hedged (for example, Brent and WTI crude oil).

15. Paragraphs B6.4.12 states:

An entity shall assess at the inception of the hedging relationship, and on an ongoing basis, whether a hedging relationship meets the hedge effectiveness requirements. At a minimum, an entity shall perform the ongoing assessment at each reporting date or upon a significant change in the circumstances affecting the hedge effectiveness requirements, whichever comes first. The assessment relates to expectations about hedge effectiveness and is therefore only forward-looking

and BC6.263 of the Basis of Conclusion which states:

Furthermore, the IASB considered that an entity should assess, on an ongoing basis, whether the hedge effectiveness requirements are still met, including any adjustment (rebalancing) that might be required in order to continue to meet those requirements (see paragraphs BC6.300–BC6.313). This was because the proposed hedge effectiveness requirements should be met throughout the term of the hedging relationship. The IASB also decided that the assessment of those requirements should be only forward-looking (ie prospective) because it related to expectations about hedge effectiveness.

Challenges related to contracts for renewable electricity

16. The general challenge for achieving hedge accounting for contracts for renewable electricity (that have the characteristics as described in paragraph 29 of Agenda Paper 3A) arise from the fact that, unlike most other forecast transactions where cash flow

variability only arises because of price uncertainty, in a contract for renewable electricity cash flow variability arises because of both price and volume uncertainty.

17. More specifically, the challenges with applying the current requirements relate mainly to the requirements for the designation of the hedged item and the economic relationship between the hedged item and hedging instrument. However, in our view the challenges are different depending on whether the forecasted transaction is a sale or a purchase of renewable electricity.¹
18. In a hedge of forecasted sales, the hedged item is typically the renewable electricity produced and sold by the specified production facility—in other words, there is a direct link between the variable volume of the hedged item to be hedged and the variable volume of the hedging instrument ie the PPA (ie the settled amounts under the PPA refer to the spot sales). However, given the uncertainty about the exact volume of electricity that would be produced, there are challenges with describing the highly probable forecasted sales with sufficient specificity in terms of timing and magnitude with regards to the volume uncertainty.²
19. On the other hand, for the purchaser, the hedged item could be designated as a component of an entity's highly probable forecasted purchases of electricity (ie a component of a nominal amount as referred to in paragraph 6.3.7 (c) of IFRS 9) based on its expected demand (which could be relatively stable). However, the designation of the hedged item will affect the assessment of the economic relationship—being the expectation that the hedged item and hedging instrument have values that will generally move in the opposite direction—and the extent of offset between the gains and losses on the hedging instrument and hedged item. For example, if the designation of the hedged item refers to a component of a nominal amount which is a fixed volume but the nominal of the hedging instrument refers to variable volume, the hedged item designation chosen has an effect on assessing the effectiveness of the hedging relationship.

¹ A forecast transaction is an uncommitted but anticipated future transaction (Appendix A of IFRS 9).

² This is consistent with the question asked in the March 2019 IFRS Interpretations Committee [agenda decision](#).

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20. We acknowledge that entities are not currently precluded from designating qualifying hedging relationships using contracts for renewable electricity as the hedging instrument. However, as a result of the challenges described in paragraphs 16–19, such hedging relationships might not faithfully reflect the actual economic outcome that is achieved through the use of the PPA. This is predominantly because the PPA might not equally distribute volume risk between the counterparties due to the source of electricity production being nature dependent. As a result, the variable volumes under the contract can only fully align to one counterparty’s forecasted transactions. In a pay-as-produced renewable electricity contract this is typically the case for the seller of the produced electricity.
21. We will further illustrate and analyse these challenges for hedges of forecasted sales and forecasted purchases separately and will make recommendations on how to resolve these challenges while at the same time ensuring that the general requirements of hedge accounting remain unchanged.
22. Whilst we are of the view that the proposed amendments to the hedge-accounting requirements discussed in this paper would better reflect the effect of an entity’s risk management activities, our proposals are only relevant to the requirements in IFRS 9. We are not proposing amendments to the hedge-accounting requirements in IAS 39 given the differences in the requirements, especially the restrictions around hedging of risk components of non-financial items and the more prescriptive hedge effectiveness requirements.
23. It is also worth noting that for ease of reference, throughout this paper we are referring to the hedging instrument as a virtual PPA, however, we do not intend to limit the proposed amendments to the hedge-accounting requirements to virtual PPAs only. If an entity wants to designate a physical PPA in a cash flow hedge, the proposed amendments would equally apply to those relationships if the physical PPA is required to be accounted for as a derivative.

Hedging forecasted sales of renewable electricity

24. To illustrate the challenge with applying the hedge-accounting requirements to forecasted sales of renewable electricity, where the output is variable and uncertain, we will use an example of a solar energy farm that, given the design and operation of the market within which electricity is transacted in, sells the electricity it produces to the national electricity market at the spot rate.
25. Separately, the entity enters into a virtual PPA with another entity, that has to buy electricity from the national electricity market at the spot rate, to net settle the difference between the spot rate and the fixed price based on the actual volume of electricity produced. In other words, the nature of the virtual PPA is such that its nominal amount will be based on the actual volume of electricity that the entity sells on the national energy market.

The economic effect of the virtual PPA

26. Economically, the virtual PPA reduces the variability in cash flows that arise from changes in the spot price component the entity is exposed to through the forecasted spot sales for the volume of electricity produced. This means that settlement of the virtual PPAs directly linked to the delivery of electricity from a reference production facility to the local energy market.
27. For example, if the virtual PPA has a volume arrangement as ‘pay-as-produced’ over the entire output of a windfarm, if 100 units are produced, 100 units will be sold into the local spot market and the PPA will require net settlement of the difference between the fixed price and spot price based on 100 units using a fixed-price nominal pricing structure. If, in the next period, 200 units are produced, the PPA will require net settlement on 200 units. Conversely, if no electricity is produced, there would be no variability in the cash flows ie there is nothing to be hedged as there would be no sales despite ongoing price volatility. In such a situation there will also be no net settlement on the virtual PPA. Economically, the seller has fixed its price per unit

output—the windfarm will achieve 100% offset even if the volume of output varies from period-to-period.

28. We illustrate the economic effect of a virtual PPA in the following (simplified) example where an entity entered into a virtual PPA that specified a fixed price of £60 MWh (column C). The volume of renewable electricity expected to be produced in three-hour intervals over a period of 24 hours is included in column A and the expected spot price (based on the forward curve) that corresponds to each three-hour interval is provided in column B.
29. At inception of the hedge (ie t_0), the market calibration of the virtual PPA result in a zero fair value as illustrated in column E, being the expected net settlement between the expected cash flows based on the spot price (column D) and the resulting final cash flow based on the fixed price agreed in the virtual PPA (column F).³

	A	B	C	D	E	F
				AxB=D	(B-C)=E	D+E=F
	Volume	Spot	Fixed	Cash flow	Cash flow	Final cash
Time	sold/net settled	Price	Price	spot sale (£)	vPPA (£)	flow (£)
	(MWh)	(£)	(£)			
03:00	1000	43	60	43,000	17,000	60,000
06:00	800	50	60	40,000	8,000	48,000
09:00	700	65	60	45,500	- 3,500	42,000
12:00	350	80	60	28,000	- 7,000	21,000
15:00	400	81	60	32,500	- 8,500	24,000
18:00	500	90	60	45,000	- 15,000	30,000
21:00	600	55	60	33,000	3,000	36,000
00:00	600	50	60	30,000	6,000	36,000
	4950			297,000	-	297,000

30. For the purpose of this illustration, we assumed that the actual volumes produced over the period were consistent with the expected volumes (column A). The shift in the spot curve after t_0 did not affect the fixed leg of the virtual PPA (column F), it has affected the floating leg (column D) that resulted in net settlement of the amount in

³ This example only assumes a one-day tenor of the virtual PPA and is therefore very simplified. At t_1 we only illustrate the actual settled amount no estimation of future cash flows.

column E. What we illustrate is that the final settled cash based on the delivery profile of the reference facility is always at £60/MWh, which £297,000 divided by 4,950MWh.

31. Settled amounts of the virtual PPA at time t1:

	A	B	C	D	E	F
				AxB=D	(B-C)=E	D+E=F
	Volume	Spot	Fixed	Cash flow	Cash flow	Final cash
Time	sold/net settled	Price	Price	spot sale (£)	vPPA (£)	flow (£)
	(MWh)	(£)	(£)			
03:00	1000	43	60	43,000	17,000	60,000
06:00	800	50	60	40,000	8,000	48,000
09:00	700	65	60	45,500	- 3,500	42,000
12:00	350	102	60	35,700	- 14,700	21,000
15:00	400	104	60	41,600	- 17,600	24,000
18:00	500	90	60	45,000	- 15,000	30,000
21:00	600	55	60	33,000	3,000	36,000
00:00	600	50	60	30,000	6,000	36,000
	4950			313,800	- 16,800	297,000

32. Therefore, in this fact pattern, the virtual PPA is economically a highly effective hedging strategy to reduce the cash flow variability related to forecasted sales as it has fixed its output price per unit sold. However, we also acknowledge that virtual PPAs may have different pricing structures to align with the particular risk management strategy of entities (for example stepped pricing, floors caps, hybrids etc.) and are therefore not always guaranteed to provide a perfect hedge.

Challenges with designating the hedged item applying the current requirements

33. When considering a similar fact pattern, the IFRS Interpretations Committee (Committee) concluded in [March 2019](#) that when assessing whether a forecast transaction is highly probable, an entity considers uncertainty of both the timing and the magnitude of the forecast transaction. The Committee also noted that the forecast electricity sale must be documented with sufficient specificity in terms of timing and

magnitude so that when such transactions occur the entity can identify whether the transaction is the hedged transaction. The Committee therefore concluded that, based on the current hedge-accounting requirements in IFRS 9, the forecast sales transaction described cannot be designated as a percentage of an uncertain and variable volume/quantity of sales during a period because that would lack the required specificity.

34. In the example described in paragraphs 27–32 of this paper, the hedged volume is variable and uncertain before the sales transaction occur, although whatever the volume is that is produced and sold will be hedged.
35. The highly probable requirement in IFRS 9 is a deliberately high threshold because, by applying hedge accounting, the entity will delay recognising in profit or loss the fair value gains or losses on the hedging instrument until the hedged cash flows affect profit or loss. Therefore, there needs to be a high degree of certainty that the hedged cash flows will in fact occur.
36. Determining whether the designated hedged item is highly probable to occur is generally not a problem where the hedged item (forecasted sales) is based on a specified nominal amount out of a larger capacity (or population) of possible ie likely sales. For example, the component of the nominal amount may be defined as a specified layer component from a defined, but open, population (see paragraph 11 of this paper).
37. Producing a specified volume of renewable electricity that is highly probable, is more achievable the smaller the specified volume is in comparison to the possible capacity of a production facility. In the case of renewable electricity, the forecasted sales for a period can be estimated as specified volumes by applying probabilities using scenario analysis. These probabilities are determined based on past experiences with similar facilities and the characteristics of the location (e.g. on-shore, off-shore, seasons etc.). Using these input factors, it is possible to project a volume of produced power that will be produced during specified periods (for example monthly or annually) at a particular confidence level based on the level at which the forecasted output is

- expected to be exceeded. In practice, P50 refers to the annual average level of production, ie the output is forecasted to be exceeded 50% of the time over a year, whereas P90 refers to the average level that will be exceeded 90% of the time.
38. However, although a specified volume can be sufficiently predicted over a period, for example a year, the actual power production, and therefore spot sales to the market, in discrete periods (e.g. monthly) is expected to be highly variable based on the nature-based conditions. Due to this volatility, there is usually a significant difference in expected volume produced between P50 and P90, with the P90 volumes typically being lower than the P50 volumes. For example, a wind farm might have a maximum capacity of producing 1000 units of electricity under the most favourable conditions, however, the P90 volume might be only 200 units (ie 90% of the time the volume will exceed this level), while the P50 volume (the most likely outcome) is 600 units and the P75 volume is 350 units.
39. Under the hedge-accounting requirements in IFRS 9, the highly probable requirement for forecasted transactions in practice is typically understood to refer to the P90 volumes. Using the example in paragraph 38, an entity would only be able to designate 200 units of forecasted sales as the hedged item in a cash flow hedge, which would equate to a layer designation as described in paragraph 11 of this paper.
40. As it is not currently possible to designate a variable amount under the IFRS 9 hedge-accounting requirements, the designation of a specified amount as a hedged item is static for the duration of the hedging relationship. This is what the Committee has summarised in its decision (see paragraph 33). Therefore, if, in the above example, the hedged item is designated as 200 units, it will remain 200 units irrespective of whether the volume produced is 400 or 600 units and the virtual PPA still provides economic offset for those volumes.
41. If an entity wants to change the specified amount of the hedged item, this typically amounts to a change in the risk management objective and result in a de-designation of the hedging relationship. Although re-designation of a new hedging relationship is possible based on a revised specified amount, the disadvantage is that on re-

designation, not only the new volume but also the updated on-market spot price would impact the calibration of the hypothetical derivative at a fair value of zero and could lead to additional ineffectiveness.

Consideration of the other qualifying criteria for hedge accounting (hedge effectiveness)

42. Once the hedged item (ie forecasted sales) and hedging instrument (ie the virtual PPA) have been designated, the entity need to satisfy the effectiveness requirements summarised in paragraphs 14–15 of this paper. This means that for a hedging relationship to qualify there must be an economic relationship between the hedged item and the hedging instrument.
43. As explained in paragraph 39 of this paper, in practice, highly probable volumes of renewable electricity are typically associated with the P90 volumes. These volumes are then used to construct a hypothetical derivative to represent the hedged item for measurement purposes. On the other hand, the valuation of the hedging instrument is typically based on the P50 estimated volumes.
44. Given this difference in volume assumptions, it becomes challenging to conclude that there is an economic relationship for effectiveness assessment purposes as required by IFRS 9. This is because designating a volume that would consistently be lower than the produced volume would not achieve economic offset and is not consistent with the objective of hedge accounting.

Proposed amendments for forecasted sales

45. The objective of hedge accounting as described in paragraph 6.1.1 of IFRS 9 is to represent, in the financial statements, the effect of an entity's risk management activities that use financial instruments to manage exposures arising from particular risks that could affect profit or loss. In our view, in addition to the challenges described in paragraphs 33–41 of this paper, designating such a hedging relationship neither faithfully reflect the economic effects of the entity's risk management

objective nor provides insight into the purpose and effect of the hedging instruments used by the entity.

46. As explained in paragraph 16, unlike other typical hedges of forecasted transactions where uncertainty/variability mostly arise from the price risk, in a hedge of renewable electricity, uncertainty also arises because of volume risk. However, unlike ineffectiveness that arises from price risk, the ineffectiveness that arises from the volume risk as a result of the static designation of the hedged item, does not represent true ineffectiveness (as explained in paragraphs 53–56 of this paper) and therefore does not faithfully represent the economic phenomena as described in paragraph 2.12 of the *Conceptual Framework for Financial Reporting*. We are therefore of the view that standard-setting in this respect is needed.
47. We think that, for contracts for renewable electricity, the objective of hedge accounting would be better achieved if the hedged item is designated as a proportion of a variable nominal amount, being a variable volume of forecasted sales from a specific production facility.
48. As the purpose of proposed amendments would be to reduce potential ineffectiveness arising from differences in designated and actual volumes of renewable electricity sales, such designation would permit an entity to align only the volume assumptions between the hedged item and hedging instrument as far as possible.
49. The variable volume to be designated is based on the entity's expectations of the volume of renewable electricity to be produced and can be periodically adjusted prospectively to reflect the entity's revised expectations, without leading to the discontinuation of the hedging relationship. With regards to the hypothetical derivative, this would enable the entity to adjust the volume assumptions while keeping the price assumptions made at inception of the hedge (ie the calibration of the fixed leg) unchanged. In other words, adjusting the volume assumptions does not require the hypothetical derivative to be recalibrated to a fair value of zero.

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50. If a virtual PPA is contracted for a proportion (ie 20%) of the total capacity of a specified production facility, that proportion of each and every sale is hedged, regardless of the actual levels of sales. The same applies even if the entity has contracted virtual PPAs for 100% of the electricity produced and sold. Consequently, there is no risk that an entity could designate a relationship that results in a deliberate over or under-hedge. This is because, if no renewable electricity is produced during the period, there would be no hedged cash flows and no net settlement cash flows on the hedged instrument.
51. We therefore believe that, with regards to forecasted sales of renewable electricity that are subject to a virtual PPA, there is no need to require the hedged cash flows to be highly probable because the designated quantity of sales is certain to occur once produced.
52. The designation of a variable notional amount as described in paragraphs 47–50, would also ensure that there is an economic relationship between the hedged item and hedging instrument and that the relationship can be expected to be highly effective.
53. In our view, such a designation, would not necessarily mean that the hedging relationship would necessarily always be perfectly effective. There are still potential sources of ineffectiveness that have to be considered, including differences between the expected and actual volumes of renewable electricity produced and differences in pricing.
54. One source of ineffectiveness would be if the actual volumes sold during the period are different from the expected volumes designated for that period. This would be the case when for example the entity expected 400 units of renewable electricity to be produced, but the actual volume produced (and on which net settlement is required under the virtual PPA) is 500 units. In our view, recognising ineffectiveness (based on the cumulative changes in fair value of the hedged item and hedging instrument since inception of the relationship) when 500 units are produced, would not be true ineffectiveness because the actual sales (of 500 units) are still economically hedged by the virtual PPA.

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55. Another source would be if there is a pricing difference between the actual sales of renewable electricity produced in the spot market and the net settlement under the virtual PPA. For example, this would be the case when the spot sales volume matches the settled volumes under the virtual PPA but the timing is not aligned which could result in a difference in spot price.
56. We are of the view that when measuring ineffectiveness applying the lower of test, no ineffectiveness must be recognised for differences in actual sales volumes and the expected sales volumes on which the hedged cash flows are based (ie as discussed in paragraph 54). However, any ineffectiveness arising from other sources must be recognised in profit or loss as per the current requirements in IFRS 9.

Hedging forecasted purchases of renewable electricity

57. Although the challenges with hedging forecasted purchases of renewable electricity are to a large extent similar to those for forecasted sales, there are however some notable differences because there is no direct link between the volume of forecasted spot purchases and the volume of electricity produced on which net settlement is required.
58. With regards to forecasted purchases of renewable electricity, the hedged item is the future spot purchases based on an entity's expected electricity usage requirement over the period of the hedged term. Therefore, when looking at the hedge item in isolation, the same volume uncertainty might not exist as for forecasted sales.
59. However, when entering into virtual PPAs, entities do so based on their expected electricity usage requirements; entities typically enter into virtual PPAs covering a portion of their expected electricity needs. Therefore, although there is not a direct link between the hedged item and hedging instrument with regards to the volume of electricity produced, there is nevertheless an indirect link and the price of forecasted purchases is economically hedged to the extent that the actual volume of electricity produced does not exceed the actual spot purchases of electricity.

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60. The challenge therefore with designating forecasted renewable electricity purchases as the hedged item in a cash flows hedge, is to specify the volume of the hedged item (which is used to construct the hypothetical derivative) in such a way that it is consistent with the expected (variable) volume of the hedging instrument. This is necessary for the purposes of evidencing the economic relationship between the hedged item and hedging instrument as described in paragraph 42–43.

The economic effect of the virtual PPA

61. Using a virtual PPA to hedge forecasted purchases has a slightly different economic effect compared to forecasted sales because there is only an indirect link between the volumes to be purchased at spot and the volumes on which net settlement is expected to be made. Therefore, both the volume and pricing uncertainties discussed in paragraph 46 could be more amplified than for forecasted sales. This is because there could be:
- (a) a difference in the timing of purchases compared to electricity production (similar to the challenges described for physical PPAs in Agenda Paper 3A for this meeting). This could then lead to differences in the spot prices at which purchases are made and those on which net settlement under the virtual PPA are based;
 - (b) a difference in the volume of electricity on which net settlement is required under the virtual PPA and the volume of spot purchases, to the extent that the net settlement volume could exceed the purchased volume; and
 - (c) basis risk arising from the referenced market in which in forecasted purchases are made (the hedged risk) being different from the referenced market on which net settlement is determined. This would be the case, for example, when an entity that purchases electricity in one jurisdiction enters into a virtual PPA with an entity that is based in another jurisdiction.

62. Using the virtual PPA example in paragraphs 28–32 we have contrasted such the cash flows due under the virtual PPA with the required spot purchases under an assumed buyer’s demand profile for electricity in the following illustration at the time t1.

t1	A	B	C	D	E	F	G
				AxC=D		D+E=F	F/A=G
					t1	t1	t1
Time	Volume demand (MWh)	Volume vPPA (MWh)	Spot Price (£/MWh)	Cash flow spot (£)	Cash flow vPPA (£)	Final cash flow (£)	Price per Volume (£)
03:00	0	1000	43	-	17,000	17,000	
06:00	0	800	50	-	8,000	8,000	
09:00	1200	700	65	78,000	- 3,500	74,500	62
12:00	1200	350	102	122,400	- 14,700	107,700	90
15:00	1300	400	104	135,200	- 17,600	117,600	90
18:00	1250	500	90	112,500	- 15,000	97,500	78
21:00	0	600	55	-	3,000	3,000	
00:00	0	600	50	-	6,000	6,000	
	4950	4950		448,100	- 16,800	431,300	87

63. This means the fixed price in the virtual PPA cannot be 100 per cent achieved from a purchaser’s perspective due to the timing differences in demand and settled amounts.
64. Although these differences could result in some residual price exposure which is not hedged through the virtual PPA and therefore the hedging relationship might be less effective than a comparable hedge of forecasted sales (as discussed in paragraphs 26–32), IFRS 9 does not preclude hedge accounting from being applied.

Challenges with designating the hedged item applying the current requirements

65. As explained in paragraph 58 of this paper, there is less uncertainty about the volume of forecasted purchases of electricity because unlike for forecasted sales, the volume of future purchases are not dependent on the volume of renewable electricity produced. An entity’s electricity needs are typically more than what they expect to be produced under the virtual PPA. When designating forecasted purchases in a cash flow hedging relationship, an entity would typically be able to determine with a high degree of certainty the total capacity of electricity usage requirements over the hedged

period and within that capacity, the highly probable volume of electricity to be purchased (for example by applying appropriate haircuts). Therefore, applying the highly probable requirement to forecasted purchases does not give rise to any specific application challenges.

66. IFRS 9 allows a hedged item to be designate as a component of a nominal amount, which could be either a proportion of an entire item or a layer component that is specified from a defined, but open, population. Therefore, applying the current hedge-accounting requirements, an entity could designate the component as the first 100 MWh of electricity purchases in a future period.
67. Although there is no direct link between the forecasted purchases and the virtual PPA, IFRS 9 requires the designation of the hedging relationship to be consistent with the entity's risk management objective. This includes the requirements in paragraph B6.4.10 for the hedge ratio to not reflect an imbalance between the weightings of the hedged item and the hedging instrument that could result in an accounting outcome that would be inconsistent with the purpose of hedge accounting. For example, an entity cannot designate a volume of forecasted purchased that deliberately exceeds the expected volumes of the virtual PPA as such a designation is solely established to avoid recognising ineffectiveness.
68. When designating a layer component from the highly probable capacity of forecasted purchases, an entity could specify an amount which corresponds or is similar to P50 volumes which would be a portion of the identified capacity.⁴ However, as for forecasted sales, the designated component is a static designation made at inception of the hedge and cannot be adjusted subsequently without risking discontinuation of the hedging relationship.
69. Although varying P50 volumes on the hedging instrument would be reflected in the measurement for the hedging instrument, the hedged item will not be adjusted and therefore could cause the economic relationship between the hedged item and hedging

⁴ When we mention P50 volumes we refer to the volumes estimated to be settled on the contracted vPPA.

instrument to break or for the hedging relationship become highly ineffective over time.

70. For example, an entity might determine that it has a highly probable capacity of forecasted electricity purchases of 1,000 MWh, while the expected volume under the virtual PPA (based on the P50 volumes) to be 400 MWh. If the entity designates the first 400MWh of forecasted purchases as the hedged item, the hedging relationship will be effective (ignoring any potential differences in pricing) if the volume of electricity under the virtual PPA is equal to or less than 400MWh. However, if the volume under the virtual PPA is more than 400MWh, say 600MWh, ineffectiveness would arise as the entity would be required to net settle on 600 Wh while only 400 MWh were designated. Such ineffectiveness would not represent the economic reality of the hedging relationship because, economically, the entity was hedged for 600GWh by the virtual PPA. True ineffectiveness will however arise if the volume under the virtual PPA is in excess of the actual spot purchases during the period.

Consideration of the other qualifying criteria for hedge accounting (hedge effectiveness)

71. Although there might be fewer challenges with determining a highly probable volume of forecasted electricity purchases, than for forecasted sales, the same challenges exist with regards to evidencing the economic relationship as described in paragraphs 42–44 of this paper. However, unlike for forecast sales, there could also be challenges that arise from the different pricing structures inherent in the virtual PPA as the hedging instrument and the spot purchases as the hedged item.
72. In addition, as noted in paragraph 61 of this paper, in the context of forecasted purchases, another source of potential ineffectiveness might be difference in the spot prices between the hedged item and hedging instrument, both because of timing and basis differences.

73. However, the fact that an entity might expect some ineffectiveness to arise in a hedging relationship does not preclude the designation of such a relationship. This is supported by the statement in paragraph BC6.241 of IFRS 9 which states:

The IASB noted that many types of hedging relationships inevitably involve some ineffectiveness that cannot be eliminated. For example, ineffectiveness could arise because of differences in the underlyings or other differences between the hedging instrument and the hedged item that the entity accepts in order to achieve a cost-effective hedging relationship. The IASB considered that when an entity establishes a hedging relationship there should be no expectation that changes in the value of the hedging instrument will systematically either exceed or be less than the change in value of the hedged item. As a result, the IASB proposed in its 2010 Hedge Accounting Exposure Draft that hedging relationships should not be established (for accounting purposes) in such a way that they include a deliberate mismatch in the weightings of the hedged item and of the hedging instrument.

74. The assessment of whether an economic relationship exists, includes an analysis of the possible behaviour of the hedging relationship during its term to ascertain whether it can be expected to meet the risk management objective and includes identifying the potential sources of ineffectiveness. As explained in paragraph 45–56 of this paper, in our view, pricing differences and any resulting ineffectiveness arising from this are actual economic effects and therefore should be considered in determining whether there is an economic relationship between the hedged item and hedging instrument.

Proposed amendments for forecasted purchases

75. Similar to our analysis on forecasted sales, we think that the objective of hedge accounting could be better achieved by making amendments to the hedge-accounting

requirements for forecasted purchases similar to those described in paragraphs 45–56 of this paper, subject to some additional requirements.

76. We are therefore recommending permitting the hedged item to be designated as a proportion of a variable nominal amount. However, because there is only an indirect link between the designated forecasted purchases and the virtual PPA, the variable nominal amount designated must be highly probable. Similar to the current practice, an entity could identify a highly probable capacity of forecasted purchases from which the variable nominal amount are designated (as described in paragraphs 65 and 66 of this paper).
77. IFRS 9 permits an entity to use a hypothetical derivative with the same critical terms that match those of the hedged item for the purposes of measuring hedge ineffectiveness. Although very commonly used in practice, a hypothetical derivative is only a mathematical expedient that can be used to calculate the value of the hedged item. Therefore, it cannot be used to include features in the value of the hedged item that only exist in the hedging instrument but not the hedged item. This requirement does not create any challenges for forecasted sales because the virtual PPA contract refers to the same forecasted sales as those used as the hedged item. However, unlike forecasted sales, the volume of forecasted purchases does not vary in accordance with the volume of renewable electricity produced under the virtual PPA. Therefore, without any proposed amendments to the requirements in paragraph B6.5.5 of IFRS 9, an entity might not be able to construct the hypothetical derivative using the volume assumptions as for the virtual PPA.
78. To ensure that the proposed amendments discussed in paragraph 71 fully achieves its intended objective, we therefore recommend that, for the purposes of forecasted purchases of electricity, an entity is permitted to use the same assumptions with regards to volume uncertainty as those that are used for the purposes of measuring the virtual PPA. However, we of the view that this only applies to the volume assumptions and not pricing assumptions (for the reasons previously discussed with regards to true ineffectiveness). Therefore, any adjustments to the hypothetical

derivative are limited to the volume assumptions without resetting the fixed leg of the derivative the current spot rate. This will mean that the fair value of the hypothetical derivative is not reset to zero every time the variable nominal amount is adjusted.

Appendix A—Illustrative example of applying the proposed amendments

Fact pattern

- A1. Entity A is a machine manufacturer who can predict its monthly electricity consumption with a high degree of certainty for a long-term time horizon. To obtain access to renewable energy in the form of electricity and to fix the unit price per purchased MWh from the local spot electricity market for a component of its required nominal volume it enters into a 20-year virtual Power Purchase Agreement (virtual PPA) with entity B. Entity A determines the estimated volumes to be settled under the virtual PPA considering all possible outcomes.

Applying the proposed amendments⁵:

- A2. Entity A designates the following cash flow hedging relationship:

The cash flow hedging relationship:

- A3. An electricity price risk hedging relationship between the local electricity spot price related variability in cash flows attributable to the forecast electricity spot price purchases as the hedged item and a receive variable pay fix virtual PPA as the hedging instrument. This hedging relationship is designated at the beginning of period 1 with a term of 20 (annual) periods.

The hedged item

- A4. The nominal amount of hedged item is a variable component of the total volume of spot electricity purchases for a particular period. The component being hedged refers to the volume component purchased first in each and every period. Entity A specifies as the hedged item a 100 per cent of the volume of the hedging instrument. For measurement of the hedged item entity A uses the same volume assumptions as those used for the virtual PPA. To ensure the specified volume is highly probable

⁵ The accounting for renewable energy certificates is disregarded in this example and the vPPA is regarded as a stand alone hedging instrument.

entity A has ensured it has sufficient highly probable capacity that exceeds the estimated variable volume per period designated as the hedged item.

The hedging instrument

A5. Entity A designates the receive variable pay fix vPPA as the hedging instrument.

Parameters

A6. For simplicity only the first five periods are displayed in the following illustrative example, discounting is ignored, the statistical allocation of different potential volumes outcomes is symmetrical and the pricing structure used for the hedging instrument and the hedged item are identical.⁶

	T1	T2	T3	T4	T5
Fixed unit price (£/MWh)	100	100	100	100	100
Expected forward spot unit price (£/MWh)	80	90	100	110	120

A7. Entity A can prove it has sufficient highly probable capacity of forecasted spot purchases for all periods considered.

A8. Based on the simplified parameters of the example an entity can prove that there is an economic relationship between the hedged item and the hedging instrument.

⁶ Typically we would expect a different pricing structure being used for the hedged item from a purchaser's perspective as the hedged item related to the forecasted spot purchases. In these cases, the economic relationship has to be assessed based on the relationship between the pricing structure of the hedging instruments compared to the hedged item.

At time t_0 :

- A9. The present value of the virtual PPA and the hypothetical derivative equal zero. This assumes that both are calibrated on-market.

	T1	T2	T3	T4	T5
Actual volume	n/a				
		P50 expected	P50 expected	P50 expected	P50 expected
Hedging instrument					
Expected volume (MWh)	65	70	75	70	65
Fixed unit price (£/MWh)	100	100	100	100	100
Expected forward spot unit price (£/MWh)	80	90	100	110	120
Expected C/F (£)	(1,300)	(700)	0	700	1,300
				PV	0
Hedged item					
Expected volume (MWh)	65	70	75	70	65
Expected forward spot unit price (£/MWh)	80	90	100	110	120
Expected C/F (£)	(5,200)	(6,300)	(7,500)	(7,700)	(7,800)
C/F (£) after hedge accounting	(6,500)	(7,000)	(7,500)	(7,000)	(6,500)
Hypothetical derivative					
Expected volume (MWh)	65	70	75	70	65
Fixed unit price (£/MWh)	100	100	100	100	100
Expected forward spot unit price (£/MWh)	80	90	100	110	120
Expected C/F (£)	1,300	700	0	(700)	(1,300)
				PV	0

At time *t1*:

	T1	T2	T3	T4	T5
Actual volume	62 actual settled	P50 expected	P50 expected	P50 expected	P50 expected
Hedging instrument					
Expected volume (MWh)	62	68	73	68	63
Fixed unit price (£/MWh)	100	100	100	100	100
Expected forward spot unit price (£/MWh)	90	93	103	113	123
Expected C/F (£)		(476)	219	884	1,449
				PV	2,076
Actual settled C/F	(620)			cum gains or losses	1,456
Hypothetical derivative					
Expected volume (MWh)	62	68	73	68	63
Fixed unit price (£/MWh)	100	100	100	100	100
Expected forward spot unit price (£/MWh)	90	93	103	113	123
Expected C/F (£)	620	476	(219)	(884)	(1,449)
				PV change	(1,456)
		Hedge effectiveness			100%
		Total gains or losses			1,456
		Unwind of CFHR in Period 1 (between T0 and T1)			620
		Final CFHR			2,076

- A10. During the first period the actual settled volume equals 62 MWh. This is based on the virtual PPA which in turn is linked to the specified hedged item (ie the same volume as the hedging instrument, despite the settled 62 MWh has deviated slightly from the initially estimated 65 MWh. This is reflected in the hypothetical derivatives accordingly). In addition, the price curve has shifted slightly. The virtual PPA is valued at a gain £2,076 for outstanding estimated cash flows of future periods with the total gains or losses of £1,456 also including the settled cash amounts of £620.
- A11. The change in the present value of the hypothetical derivative equals the total gains and losses on the virtual PPA. Therefore, in this specific case all of the values changed on the hedging instrument can be deferred in OCI.

Accounting entries:

Dr B/S	£1,456
Cr OCI reserve	£1,456
Dr B/S	£620
Cr Cash	£620
Dr COS	£620
Cr OCI reserve	£620
Dr COS (spot purchases)	£5,580
Cr Cash	£5,580

A12. Values at the end of the period:

Balance sheet:	(£2,076)
OCI:	£2,076
COS	£6,200
Cash:	(£6,200)

A13. For period t1 entity A achieves a hedged unit price of £100 per MWh.