KPMG

# Hedging electricity in the Irish market

KPMG in Ireland
**kpmg.ie**

# Contents

# 1. Introduction

Global commodity markets have been significantly impacted by a rise in prices and volatility due to the geopolitical uncertainties, supply chain issues and a rise in inflation. Various commodity prices have hit record highs in March 2022. The energy industry has also been impacted by this uncertainty and volatility in commodity prices (Refer Figures 1 to 2).

Electricity in Ireland is purchased and sold on the Integrated Single Electricity Market ("I-SEM"). Generating entities (the companies that generate and transmit electricity) and Suppliers (the companies that sell electricity to homes and businesses) purchase/sell electricity via the I-SEM markets (Day Ahead, Intraday, Forwards and Capacity Markets). I-SEM also enables market participants to hedge their electricity price risk using Contract-for-Difference ("CfD") in the Forwards Market (as defined by I-SEM). Directed Contracts, which are a form of CfD, are offered by ESB as the counterparty and enable energy companies to hedge the price (or a component of it) at which energy is purchased/sold in the future. The pricing methodology, pricing formula and quantity of Directed Contracts ("DC"s) being offered in the I-SEM, are decided by the Regulatory Authorities ("RA"s) viz. Northern Ireland Authority for Utility Regulation ("NIAUR") and the Commission for Energy Regulation ("CER"). Each transaction under a Directed Contract comprises of a two-way Contract for Difference and a European style Commodity Call Option to hedge capacity market Reliability Option exposure. Currently the maturities of the DCs being offered are for up to four quarters.

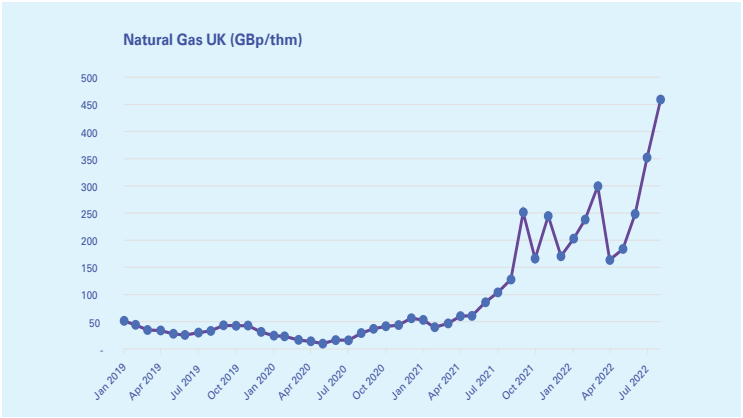


*Figure 1: UK Natural Gas prices (GBp/therm) from 2019-2022*[1]

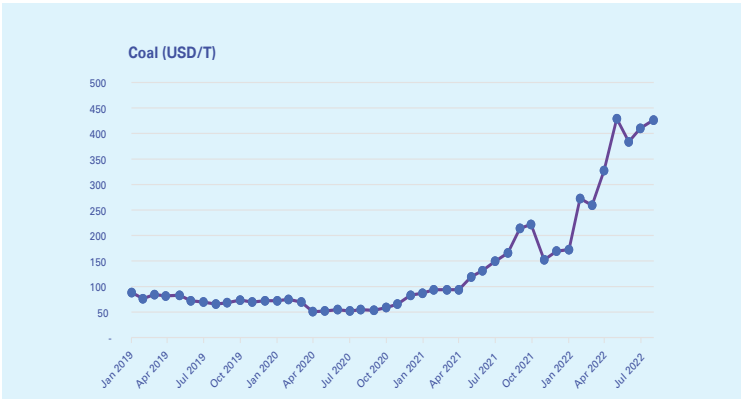


*Figure 2: Coal prices (USD/T) from 2019-2022*[2]

**"The energy industry has also been impacted by this uncertainty and volatilityin commodity prices**

[1] Source: https://tradingeconomics.com/commodity (Jan 2019 to Aug 2022)
[2] Source: https://tradingeconomics.com/commodity (Jan 2019 to Aug 2022)

# 2. Hedging Electricity Prices

The prices of electricity depend on the price of inputs used in its generation. As per the SEM Committee's ("SEM") Quarterly Market Monitoring Unit Report for Q1 of 2022[3] , the fuel mix of metered generation of electricity across the island of Ireland in Q1 of 2022 was represented by gas (39.25%), wind (37.78%), coal (14.39%), oil (1.78%) and Other[4] (6.8%). An increase in the price of inputs is expected to increase the price of electricity, although an increase in wind tends to reduce electricity prices. The uncertainty in the future commodity prices and wind forecasts results in uncertainty in the future electricity prices. This is aggravated by high volatility in the commodity markets causing energy market participants (both generating entities and suppliers) to consider hedging their electricity price risk.

### Hedging Using Electricity CfD Contracts

Energy market participants often use multiple strategies to hedge electricity price risk. One of the approaches is to hedge using the forward electricity market which is facilitated by I-SEM's Forwards Market through use of CfD contracts.

A CfD is a financial instrument in which a price is agreed upon (the "strike price") for a quantity of an underlying on a future day. On settlement, the contract holder receives or pays the difference between the contract strike price and the spot price (Day-ahead price) of the underlying ("reference price"). A CfD is a financial trade which results in a gain or loss, but there is no physical delivery or receipt of the underlying.

### How the electricity CfD works

If the market price of electricity exceeds the strike price of the CfD, the buyer of the CfD receives the difference between the Day-ahead market price and strike price on each unit of capacity contracted on the CfD. If the market price of electricity is less than the strike price of electricity, the buyer pays the difference between the market price and strike price on each unit of capacity contracted on the CfD. This results in an effective price equal to the contracted strike price for both parties to the contract. The CfD contracts are cash settled and do not require a physical delivery of electricity. Several energy players are increasingly hedging their electricity price risk against future uncertainties using CfD contracts.

### Proxy Hedging

Energy participants also hedge their electricity price risk using a proxy hedging strategy. Proxy hedging involves hedging the risk on an exposure using a financial instrument/ contract based on a different risk exposure whose price movements are correlated. Electricity prices are generally correlated with commodities that are used in the generation of electricity. Irish electricity prices are correlated with natural gas prices. However, this correlation is not static and changes over time. For example, previously a larger proportion of the electricity in Ireland was generated using natural gas. With the increase of wind energy in generation of electricity, it is likely that the correlation between Irish electricity prices and natural gas prices has changed over time.

An example of a proxy hedging strategy adopted by energy participants is to use natural gas commodity derivative contracts to hedge the price risk of electricity. The price of electricity may be influenced by more than one commodity. However, in this strategy, a participant may opt to hedge the risk partially. The effectiveness of a proxy hedging strategy would depend on the extent to which the price of a commodity contributes to the price of electricity and the degree of price correlation between the two commodities (which could also change over time). A proxy hedge is not a perfect hedge and therefore, would lead to some hedging ineffectiveness. However, with proxy hedging, participants can benefit from the liquidity available in the proxy commodity forwards/futures market. This helps reduce hedging costs and provides greater flexibility to unwind or scale up the hedge ratios and positions. Figure 3 indicates the relation between prices of Irish Baseload Electricity and UK Natural Gas.

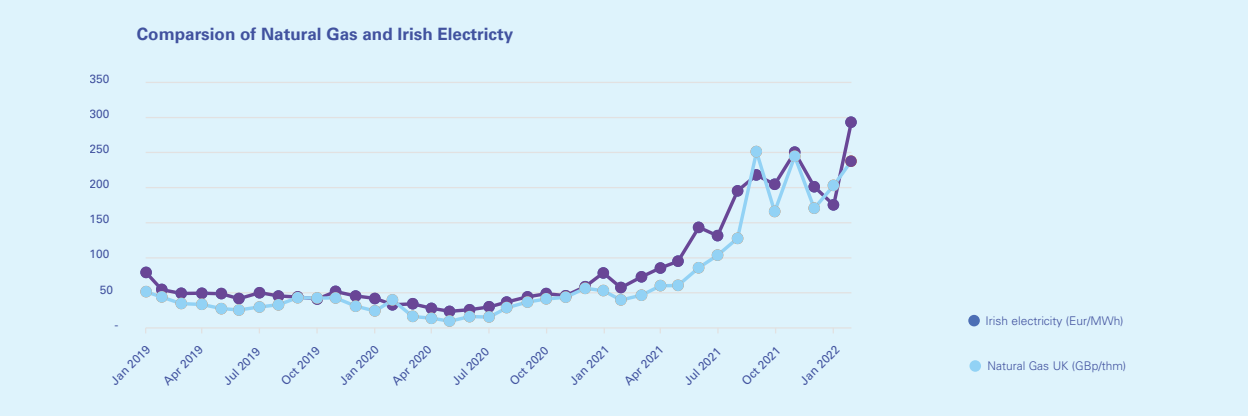


*Figure 3: Comparison of Ireland Electricity prices[5] and UK Natural Gas prices[6] for the period Jan 2019 to Feb 2022*

[3] Source: https://www.semcommittee.com/sites/semc/files/media-files/Market%20Monitoring%20Unit%20Quarterly%20Report%20Q1%202022.pdf
[4] Biomass, Distillate, Peat, Hydro and Pumped Storage
[5] Source: Average monthly electricity wholesale price in Ireland from January 2019 to Feb 2022 by Statista (https://www.statista.com/)
[6] Source: https://tradingeconomics.com/commodity (Jan 2019 to Feb 2022)

# 3. Fair Valuation of Electricity CfD Contracts

In Ireland, electricity is traded in the Day-Ahead Market ("DAM") and Intraday Market ("IDM"), which is closer to the time of delivery of electricity. The DAM closes on the day before delivery of electricity and the IDM operates in the period between closure of the DAM and one hour before delivery. Electricity is not traded in the futures market and forward prices of Irish electricity are not quoted in an active market making, these prices unobservable. Therefore, fair valuation of electricity CfD contracts are not Level 1 valuations in the fair valuation hierarchy.

## IFRS 13 – Fair Value Measurement

IFRS 13 – Fair Value Measurement, establishes a fair value hierarchy that categorises into three levels the valuation techniques used to measure fair value. The fair value hierarchy gives the highest priority to quoted prices (unadjusted) in active markets for identical assets or liabilities ("Level 1") and the lowest priority to valuation techniques using unobservable inputs ("Level 3"). As the valuation inputs into CfD valuations, such as forward market prices and long term electricity price forecasts, are unobservable and not actively quoted, they are classified as Level 3 instruments in the fair value hierarchy.

As per the requirements of IFRS 13, "Unobservable inputs shall be used to measure fair value to the extent that relevant observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at the measurement date. However, the fair value measurement objective remains the same, i.e. an exit price at the measurement date from the perspective of a market participant that holds the asset or owes the liability. Therefore, unobservable inputs shall reflect the assumptions that market participants would use when pricing the asset or liability, including assumptions about risk." Consistent with the fair value measurement objective, the fair value of an electricity CfD should be the exit price of the contract at measurement date.

## Using SEM's DC Pricing formula

One of the widely used approaches to fair value CfD contracts is to use the pricing formula published by the SEM Committee in its Information Paper pertaining to the recent subscription round of Quarterly Directed Contracts ("DC"s). The pricing formula for DCs recognises that forward market prices for electricity depend on forward market prices for fuel and emissions (specifically, CO2). The pricing formula is provided for a calendar quarter (for up to four quarters) for each product type (baseload, mid-merit or peak) as a function of the forward fuel and emissions prices.

As per the Directed Contracts Implementation Paper (SEM-17-064)[7], *"The derivation of the DC pricing formulae comes from a set of regressions. The dependent variable in these regressions will be the mean of the DAM Price; the relevant independent variables are fuel and emission cost inputs. The regression will be run on pseudo data, i.e., a number of runs of the model at a variety of conditions will be run to give the regression the necessary variation to yield, after linear regression, proper conditional prices which reflect the mean DAM Price under different input price conditions. Mean DAM prices will be calculated by quarter and product type – with the means being weighted averages with weights to match the delivery requirements for each product type."*

This approach to pricing ensures that the strike prices for DC transactions appropriately reflect the contemporary market prices of fuel and emissions markets. Every quarter, the SEM Committee releases a paper with the quantities and pricing for the upcoming quarterly DC subscription round. The fair value of CfD contracts maturing up to a year in the future can be derived using the latest pricing formulae and the forward prices of fuel, as per the methodology set out in the Directed Contract Subscription Rules[8] published by the SEM Committee and updated from time to time.

**Table 1:** An extract of the coefficients for the various product types (Baseload, Midmerit, Peak) for quarterly periods as per the latest Round 19 of Quarterly Directed Contracts Q4 2022 to Q3 2023 published on 15 June, 2022[9]

| **Coefficients** Multiply gas coefficient by euro/therm Gas price, Coal coefficient by euro/tonne coal price, and $CO_2$ coefficient by euro/ tonne $CO_2$ price | | | | | |
|---|---|---|---|---|---|
| **Contract (p)** | **Quarter (q)** | **Constant ($\alpha_{q,p}$)** | **Gas ($\beta_{q,p}$)** | **Coal ($\delta_{q,p}$)** | **CO2 ($\varepsilon_{q,p}$)** |
| Baseload | Q4 22 | 18.69 | 59.621 | 0.0254 | 0.4320 |
| Midmerit 1 | Q4 22 | 24.57 | 65.733 | 0.0197 | 0.4496 |
| Peak | Q4 22 | 45.91 | 74.648 | 0.0233 | 0.5050 |
| Baseload | Q1 23 | 19.87 | 62.485 | 0.0233 | 0.4319 |
| Midmerit 1 | Q1 23 | 27.05 | 67.968 | 0.0182 | 0.4403 |
| Peak | Q1 23 | 51.06 | 75.791 | 0.0217 | 0.4903 |

[7] WP-05: Institutional Arrangements (semcommittee.com)
[8] SEM Committee - ESB Power Generation Directed Contract Subscription Rules (SEM-18-036d)
[9] SEM-22-029

## Other approaches

For contracts maturing beyond one year, in the absence of a pricing formula published by SEM and a forward curve for the Irish electricity market, alternative approaches may be adopted by market participants to price the CfD contracts. One such approach is to apply an average summer/winter spark spread over the forward fuel prices. Spark spread is the difference between wholesale electricity prices and its cost of production using natural gas. The spark spread would vary based on the efficiency of an electricity generating unit. The spark spread would vary between seasons.

Another approach could be to use a comparative curve from an alternative market to derive the forward prices.

Refer to Figure 4 for a comparative analysis of the historical prices of Irish electricity and UK electricity and Figure 5 for a comparative analysis of the historical prices of Irish electricity and German electricity. A forward curve for these alternative markets is published by a few vendors for around 7 to 10 years in the future. Needless to say, these forward curves would have to be evaluated for their relevance and reliability.

The application of various unobservable inputs and adjustments to ascertain the price reduces comparability in the fair valuation of electricity CfD contracts between peer companies.

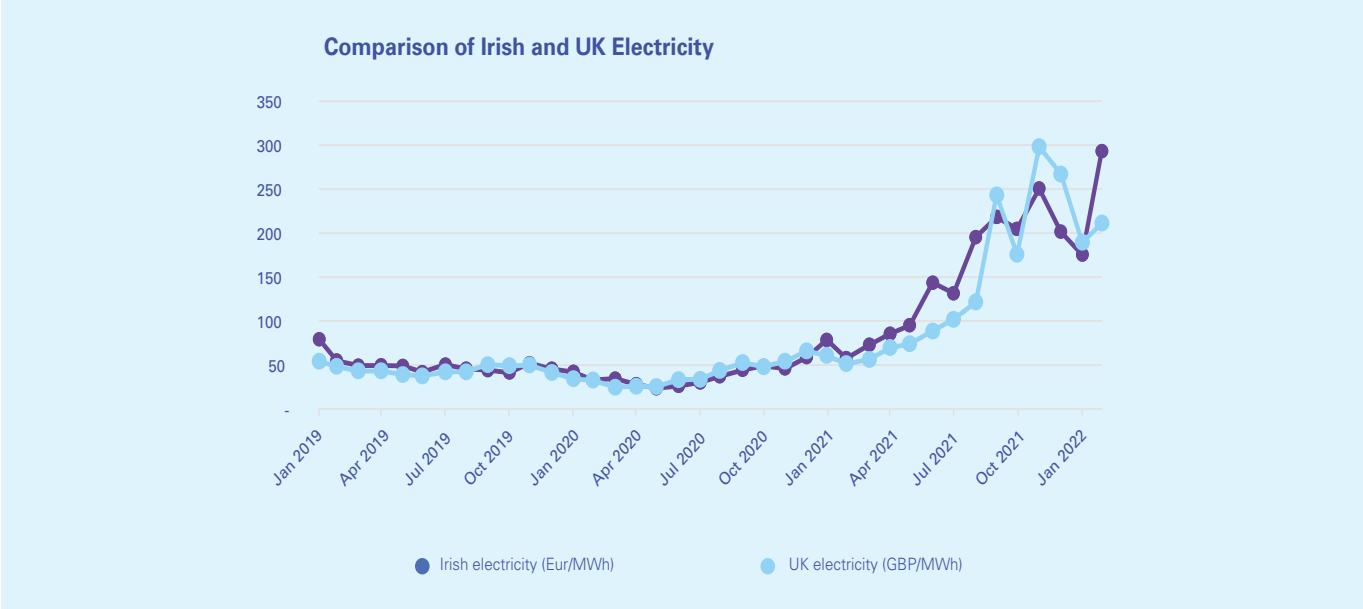


*Figure 4: A comparison of the historical Irish Electricity prices[10] and UK Electricity prices[11] for the period Jan 2019 to Feb 2022*

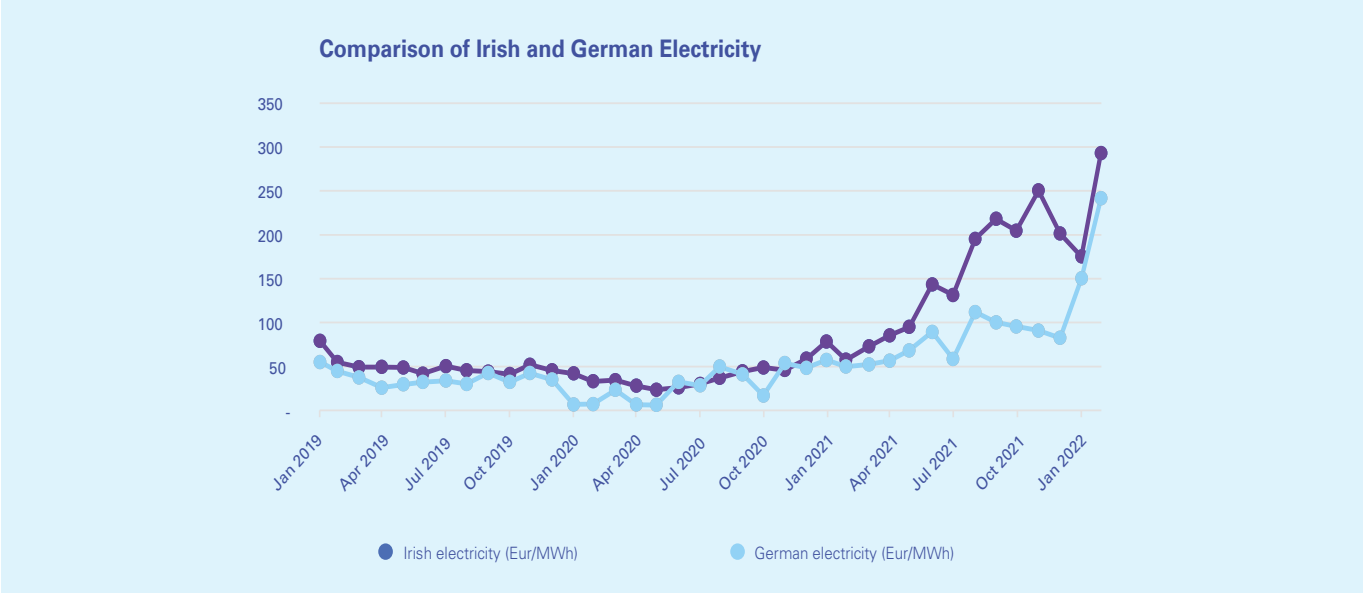


*Figure 5: A comparison of the historical Irish Electricity prices[12] and German electricity prices[13] for the period Jan 2019 to Feb 2022*

[10] Source: Average monthly electricity wholesale price in Ireland from January 2019 to Feb 2022 by Statista (https://www.statista.com/)
[11] Source: https://tradingeconomics.com/commodity (Jan 2019 to Feb 2022)
[12] Source: Average monthly electricity wholesale price in Ireland from January 2019 to Feb 2022 by Statista (https://www.statista.com/)
[13] Source: https://tradingeconomics.com/commodity (Jan 2019 to Feb 2022)

# 4. Credit Risk and Fair Value Adjustments

Counterparties to a CfD contract put in place a credit support annex ("CSA") document, in order to manage the counterparty credit risk associated with the electricity CfD contracts. Margin is posted either in cash or through letters of credit when the exposure is at least equal to the threshold amounts agreed by the parties in accordance with the CSA. Exchange of eligible credit support reduces the credit risk on the instruments and should be considered in the fair value adjustments being applied to the CfD contracts. Fair value adjustments for credit risk should also factor master netting agreements and allocation of credit risk to individual instruments.

# 5. Applying Hedge Accounting

As per the accounting standard requirements under IFRS 9/IAS 39 ("the Standard"), derivatives are to be measured at fair value through profit and loss. At each reporting date, the change in fair value of the derivative would impact the statement of profit or loss, which could result in volatility in the statement of profit or loss. An entity may opt to apply hedge accounting to represent the effect of its risk management activities in its financial statements.

### Qualifying criteria

The Standard defines the qualifying criteria that are required to be met in order to apply hedge accounting:

**A** The hedging relationship should consist of eligible hedging instruments (instrument that is used to hedge the risk) and eligible hedged items (the risk that is being hedged)

**B** Formal documentation is put in place at inception

**C** The hedging relationship meets all of the effectiveness requirements

#### i. Under IAS 39

- the hedge is expected to be highly effective in achieving offsetting changes in fair value or cash flows attributable to the hedged risk during the period for which the hedge is designated or for the period until the amount of the hedging instrument next is adjusted (prospective effectiveness); and
- the actual results of the hedge are within the range of 80-125 percent (retrospective effectiveness)

#### ii. Under IFRS 9

- there is an economic relationship between the hedged item and the hedging instrument
- the effect of credit risk does not dominate the value changes that result from the economic relationship; and
- the hedge ratio of the hedging relationship:
  - is the same as that resulting from the quantities of:
  - the hedged item that the entity actually hedges; and
  - the hedging instrument that the entity actually uses to hedge that quantity of hedged item; and
  - is not achieved by intentionally weighting the hedged item and the hedging instrument to create hedge ineffectiveness - whether or not it is recognised - to achieve an accounting outcome that would be inconsistent with the purpose of hedge accounting.

Market participants would have to put in place their hedge documentation and hedge effectiveness testing framework to adopt the benefits of hedge accounting.

One of the criteria to qualify for hedge accounting is that the hedged item is required to be reliably measurable. Considering there are unobservable inputs (such as forward electricity prices and long-term electricity price projections) in the forecasting of changes in hedged cash flows where the electricity prices are hedged, an entity would have to document its assessment of whether the hedged item is reliably measurable. An entity would document its assessment at inception and update it periodically.

### Cash flow hedges

A cash flow hedge is a hedge of the exposure to variability in cash flows that is attributable to a particular risk associated with all, or a component of, a recognised asset or liability (such as all or some future interest payments on variable-rate debt) or a highly probable forecast transaction and could affect profit or loss. In case of generating entities and suppliers, the risk being hedged would be the price risk on a forecast sale or purchase of electricity in the future which would classify as a cash flow hedge.

### Highly probable forecast transactions

In order to adopt hedge accounting for forecast transactions, the Standard requires that the forecast transactions are highly probable. In our view, for a forecast transaction to be considered highly probable there should be at least a 90 percent probability of the transaction occurring. In assessing whether a transaction is highly probable, consideration should be given to uncertainty over both the timing and magnitude of the forecast transaction, and the facts and circumstances, including: the quality of the budgeting processes; the extent and frequency of similar transactions in the past; whether previous similar expected cash flows actually occurred; the availability of adequate resources to finish the transaction; the impact on operations if the transaction does not occur; how far into the future the transaction is expected to occur; and the quantity of anticipated transactions.

A common instrument used in hedging energy prices is a load following swap. A load following swap is a contract with a variable notional that is dependent on the hedged volumes (forecast energy sales) and has a fixed price. At its March 2019 meeting[14], the International Financial

[14] https://www.ifrs.org/content/dam/ifrs/supporting-implementation/agenda-decisions/2019/ifrs9ias39applicationofthehighlyprobablerequirementwhenaspecificderivativeisdesignatedasahedginginst.pdf

Reporting Standards Interpretations Committee ("IFRIC") concluded that the terms of the hedging instrument do not affect the highly probable assessment of the hedged item. When a load following swap is used as a hedging instrument in a hedging relationship, it cannot be concluded that the hedged item is highly probable simply because the hedging instrument will align with the hedged item as and when it occurs. An entity must document the forecast transaction with sufficient specificity in terms of magnitude and timing at inception of the hedge so that when such transactions occur, the entity can identify whether the transaction is a hedged transaction.This can be very difficult when the magnitude and timing of the forecast transaction is uncertain.

### Hedge effectiveness and ineffectiveness assessment

'Hedge ineffectiveness' is the extent to which changes in the fair value or cash flows of the hedging instrument offset changes in the fair value or cash flows of the hedged item for the hedged risk(s). According to the different applicable Standards, the methodology to test effectiveness differs. The specific effectiveness requirements as per IFRS 9 and IAS 39 are listed in the paragraph pertaining to the qualifying criteria above. 'Hedge ineffectiveness', is the extent to which the changes in the fair value or cash flows of the hedging instrument are greater or less than those on the hedged item for the hedged risk(s). When designating a hedging relationship, and on an ongoing basis, an analysis of the sources of hedge ineffectiveness that are expected to affect the hedging relationship during its term is performed. This analysis serves as the basis for the assessment of whether the hedge meets the effectiveness requirements. A few sources that could cause ineffectiveness in the hedging relationship include scenarios where critical terms (such as notional, timing or maturity, underlying risk, etc.) of the hedging instrument and hedged item do not match or where the credit risk of the hedging instrument and/or the hedged item impact the hedging relationship.

### Accounting for cash flow hedges

Under cashflow hedge accounting, as long as the cash flow hedge meets the qualifying criteria established by the Standard, the portion of the gains and losses on the hedging instrument that is determined to be an effective hedge (i.e. lower of the cumulative gain or loss on the hedging instrument from inception of the hedge and the cumulative change in fair value (present value) of the hedged item from inception of the hedge) shall be recognised in other comprehensive income. Any remaining gain or loss on the hedging instrument which is hedge ineffectiveness shall be recognised in profit or loss. In a hedge of a forecast transaction, the application of hedge accounting reduces volatility in statement of profit or loss by enabling the mark-to-market gains and losses to be recognised through other comprehensive income in a separate component of equity. The accumulated amount is reclassified from the cash flow hedge reserve to profit or loss as a reclassification adjustment in the period or periods during which the hedged expected future cash flows affect profit or loss - e.g., when the forecast sale occurs.

### Proxy hedging under IAS 39

In the case where proxy hedging strategy is applied, the hedge accounting application could differ between the two accounting standards. Under IAS 39, a non-financial item can be hedged with respect to either all of its risks or foreign currency risk only. This is because foreign currency risk is the only risk associated with a non-financial item that is considered to be separately measurable. Accordingly, even where a component of the risk associated with a non-financial item is hedged, the hedge designation should be in respect to all of the risks on the hedged item. This results in ineffectiveness that impacts profit and loss statement, where only a component of the risks is hedged under IAS 39.

For example, an entity hedges only a single component of the electricity prices such as natural gas price movements using natural gas futures. The future prices of electricity (hedged item) are however, impacted by prices of carbon and coal in addition to natural gas prices. Under IAS 39, the entity can only designate the hedged item with respect to all of its risk. This would mean that the changes in the fair value of the hedged item would include changes in the fair value of all of its risk. Whereas the changes in the fair value of the hedging instrument would only include changes in fair value of natural gas price risk. On performing a hedge effectiveness assessment, the fair value or cash flows of the hedging instrument would not completely offset changes in the fair value or cash flows of the hedged item which would result in ineffectiveness in the hedging relationship. The treatment under IFRS 9 differs from above.

## Component hedging under IFRS 9

IFRS 9 allows an entity to designate a risk component of a hedged item in a hedging relationship. Risk components include the changes in the cash flows or fair value of an item attributable to a specific risk or risks. To be eligible for designation as a hedged item, a risk component needs to meet the following criteria:

- it is a separately identifiable component of the financial or non-financial item; and
- the changes in the cash flows or fair value of the item attributable to changes in that risk component are reliably measurable

When determining if a risk component is eligible for designation as a hedged item, an entity assesses the component in the context of the particular market structure to which the risk relates and in which the hedging activity takes place. This is true for both contractually specified and non-contractually specified risks, as well as for risks related to both financial and non-financial items. The evaluation of whether a risk component is separately identifiable and reliably measurable may require judgement. If a component is explicitly specified in a contract - e.g., a pricing formula that uses a reference to a benchmark commodity price - then concluding that it is separately identifiable may be straightforward. If the component is not contractually specified, then the entity will need to consider whether the risk is separately considered in pricing the hedged item in the related market- e.g., natural gas prices are considered by SEM while setting the DC price of electricity. Whether sufficient observable forward transactions for the component exist may be a factor to consider in concluding whether a component is reliably measurable. Designation of a risk component of the hedged item in this case, could reduce ineffectiveness in the hedging relationship and better reflect the risk management objective resulting in a more efficient designation of the hedging relationship.

A rise in commodity prices and volatility has generated a lot more interest among energy participants to hedge their risk. In addition to their hedging framework, it is worthwhile for participants to evaluate their fair valuation and accounting framework for these hedging instruments in order to manage profit or loss statement volatility and to comply with the financial reporting and disclosure requirements.

# 6. How can KPMG help?

KPMG's Financial Instruments team of highly experienced professionals and subject matter experts help clients analyse complex problems and offer bespoke solutions to address specific risks and challenges. KPMG leverages expertise across the firm to provide guidance and industry focused insights and acts as your trusted advisor as you navigate through the various phases of economic, regulatory and accounting uncertainty.

# Contacts


**Jorge Fernandez Revilla**
Partner,
Head of Asset Management
KPMG in Ireland
**e:** jorge.revilla@kpmg.ie
**t:** +353 1 410 2776

**Francisco Jimenez**
Director,
KPMG Financial Instruments
KPMG in Ireland
**e:** francisco.jimenez@kpmg.ie
**t:** +353 1 700 4092

**Simone Aranha**
Manager,
KPMG Financial Instruments
KPMG in Ireland
**e:** simone.aranha@kpmg.ie
**t:** +353 86 011 2580


**kpmg.ie**




Produced by: KPMG's Creative Services.
Publication Date: October 2022. (8535)