The AFMA Carbon Benchmark Addendum explained

Questions have arisen from time to time about the purpose of the AFMA Carbon Benchmark Addendum (the Addendum). In particular, it is sometimes asked if it might somehow present a risk of higher electricity prices for consumers. The short answer is that it does not lead to higher prices for electricity. Rather, it assists the efficient operation of the electricity derivatives market, which benefits all of its users.

A more detailed explanation of the Addendum may assist those interested in its purpose and its effect on OTC electricity derivative transactions and this note uses illustrative examples to provide this information in an accessible form.

Key points

- The Addendum is for use between participants in the wholesale over-the-counter (OTC) electricity derivatives market
- It offsets any gains/losses (which are not known at the time of entering into a transaction) from the impact of a carbon scheme on future electricity prices in the National Electricity Market (NEM)

Background

One of the greatest risks in markets such as carbon is legislative risk – scheme rules can change, the scheme may be deferred or discontinued etc. The AFMA Carbon Benchmark Addendum to an OTC electricity derivative contract is specifically designed to largely neutralise this risk.

It allows electricity to be traded separately from any carbon scheme cost inherent in future NEM pool prices. It is an equitable method of offsetting windfall gains and losses arising from the impact of a carbon scheme on NEM pool prices between participants in wholesale OTC electricity derivative markets. The Addendum has been widely accepted by wholesale market participants – retailers, generators and financial intermediaries.

The risk reduction benefits provided by the Addendum are significant. For instance, in the past, listed futures contracts that included a premium for carbon in traded prices have resulted in windfall gains to sellers and material losses to buyers when an expected carbon scheme did not eventuate. This was clearly the case when implementation plans for the Carbon Pollution Reduction Scheme were halted in April 2010, and entities which had undertaken normal hedging activities suffered losses/gains entirely because of changes in government policy.

Such windfall gains and losses would not have happened with OTC contracts incorporating the Addendum, as it allows for the risks of a failure of the scheme to commence (or the risk of scheme termination) to be dealt with in a fair and efficient manner. Quite simply, although part of the deal documentation, the Addendum has no operation in the absence of a carbon scheme.

Hedging electricity prices using OTC swaps

Retailers and generators are natural counterparties in the NEM, and often enter into hedges which help manage their exposure to the floating NEM pool price. As an example, if generator ("G") agrees to receive a fixed price of $40/MWh (megawatt hour) for 10 MW (megawatts) and pay the (floating) NEM pool price for a specified period and a retailer ("R") agrees to pay the same fixed price of $40/MWh for 10 MW and receive the (floating) NEM pool price for the same period, they have entered into an electricity "swap". Note that this is purely a financial transaction to reduce price risk and does not, of itself, give rise to purchase, sale or delivery of actual electricity.

If, for a particular half-hour period, the NEM pool price is $46 per MWh (megawatt hour), the notional cash flows under the swap are:

G receives $40 and pays $46 per MWh; and
R pays $40 and receives $46 per MWh

As the NEM settlement period is half an hour and the contract prices are in MWh, the volume (which was expressed in MW) needs to be divided by 2 to get a MWh figure.

The net payment under the 10 MW swap for a half hour period is therefore

($46 – $40)*10/2 = $30 from G to R.

G earns $460/2 = $230 for the electricity sold to the NEM less the $30 paid to R under the swap, giving net income of $200. Conversely, the cost to R to buy the electricity from the NEM is $230 which is partially offset by the $30 received from G giving a net cost of $200.

If the pool price turned out to be $34 per MWh, the swap cash flows would be reversed but the parties would still pay and receive $200 after swap settlement. The swap has "locked in" a fixed price of $40 per MWh for both counterparties.

Swap outcomes using the Addendum

If a carbon scheme is not introduced or does not commence, then the swap payment is the same as that described above, as there is no requirement under the Addendum to adjust the outcome for a carbon price.

If a Carbon Scheme, such as that under the Clean Energy Future legislation, is in force, the NEM pool price could be expected to rise by the carbon impost. The amount of that impost is not known at the time deals which run past the date of scheme implementation are entered into. Hence it is difficult for OTC market participants to estimate the increase in future NEM pool prices attributable to carbon.

In that circumstance, had the Addendum been incorporated into a transaction, it would come into force and provide a mechanism to increase the fixed price. The Addendum determines an adjustment to the Fixed Price in the electricity swap above by reference to two numbers:

1. The Average Carbon Intensity (ACI) in the NEM using the NEM-wide daily Carbon Dioxide Equivalent Intensity Index (CDEII) as published by the Australian Energy Market Operator (AEMO); and
2. The Carbon Reference Price (CRP) which is set in accordance with a methodology determined by the AFMA Electricity Committee.

Fallback positions for both measures are incorporated in the Addendum.

With a CRP of $23/t$CO_2$-e (the price in the fixed-price period from 1 July 2012 to 30 June 2013) and an ACI of 0.95 tCO_2-e/MWh (assumed for the purposes of this example), the carbon adjustment applied to the fixed price would be $23 x 0.95 = $21.85/MWh. This method is designed to calculate an adjustment which is close to the actual increase in the NEM pool price. This approach was developed by AFMA members as the most robust and transparent methodology to estimate the NEM pool price increase.

Assuming a NEM pool price of $68 the notional cash flows under the swap are:

> G receives $40 (under the swap) and $21.85 (under the Addendum) = $61.85 and pays $68 per MWh.
>
> R pays $40 (under the swap) and $21.85 (under the Addendum) = $61.85 and receives $68 per MWh.

The net payment is:

($68 – $61.85)*10/2 = $30.75 from G to R.

G earns $680/2 = $340 for the electricity sold to the NEM less the $30.75 paid to R under the swap, giving net income of $309.25. The cost to R to buy the electricity from the NEM is $340 but this is partially offset by the $30.75 received from G giving a net cost of $309.25.

Swap outcomes under a carbon scheme without the Addendum

If the Addendum were not in place the notional cash flows would be:

> G receives $40 and pays $68 per MWh.
>
> R pays $40 and receives $68 per MWh.

The net payment is:

($68 – $40)*10/2 = $140 from G to R.

G earns $680/2 = $340 for the electricity sold to the NEM less the $140 paid to R under the swap, giving net income of $200. The cost to R to buy the electricity from the NEM is $340 but this is partially offset by the $140 received from G giving a net cost of $200. This is the same outcome as the original example, so the full impost of the cost of carbon (a cost not known at the time of entering into the contract) is borne by G – which is not the intended outcome of a carbon scheme.

Conclusion

The Addendum largely mitigates the market risks in electricity OTC derivatives arising from a scheme to price carbon.

Incorporating the Addendum into OTC trades means that parties to the contract can accommodate changes to the swap prices based on the impact of a carbon price at the time it applies, rather than

locking in a price at the time of contracting which requires an estimate of the likelihood of a carbon scheme being in existence and the impact on NEM pool prices if it were.

The Addendum allows OTC market participants to trade on prices that do not include a component for carbon. For example, if the OTC price for a particular period was $40/MW, the carbon inclusive price would be somewhere between that and the expected NEM pool price under a carbon scheme discounted by the market participants' expectations that a scheme will actually be in place. For example, with a permit price of $23 in the fixed price period and a 75% chance the scheme would be in existence, the inclusive price would be around $57.25.

The Addendum only applies so as to make adjustments under an OTC derivative transaction when a "Carbon Scheme" or "Carbon Tax" is in operation.

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