

The Development of a Liquid Electricity Hedge Market in New Zealand

**A paper prepared for the New Zealand
Electricity Commission**

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CYBELE CAPITAL

Introduction

We have been asked by the Electricity Commission (the Commission) to assist it in considering what characteristics a liquid hedge market should have, what developments are required to establish these characteristics, and what role the Commission can play in the development of the hedge market - the Work. Given the recent announcement of changes to the electricity market in general and hedge markets in particular from the Ministerial Review of the Energy Market¹ (hereafter the Ministerial Review) we have also provided an assessment on these proposed changes and linkages with the Commission's Market Development Plan (MDP).

This paper has been structured to initially provide a discussion on the following

- A description of the key characteristics of a liquid hedge market that could be reasonably attained in New Zealand;
- An assessment of the Energy Minister's announced changes that relate to the hedge market;
- A description of any additional market developments that should occur to improve hedge market liquidity;
- Comments on key linkages with MDP projects; and
- An opinion on the Commission's role in introducing the changes outlined above.

As part of this work we have reviewed a wide variety of material and spoken to a range of existing and prospective market participants. Individuals haven't been identified within the document unless we have thought it important to do so. Where quotations have been made we have annotated references within the text of the document, no bibliography is provided at the end of this report.

Cybele Capital Limited is a shareholder in Carbon & Energy Partners Limited (CEP) a consulting business currently undertaking work for Energy Hedge Limited on the development and enhancement of the current Energy Hedge platform. James Moulder has undertaken the Work for the Electricity Commission while maintaining a professional distance and appropriate safeguards from work being undertaken by CEP for Energy Hedge Limited.

If you have any questions about this work, or our approach to the engagement please do not hesitate to contact me at james.moulder@cybelecapital.com.

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January 2010

¹ Conducted by the Ministry of Economic Development (MED) and an Electricity Technical Advisory Group (ETAG) which culminated in changes announced by the Minister of Energy and Resources on 9 December 2009.

Executive Summary

Liquidity

Within the New Zealand electricity context, there is a clear need for market participants, particularly retailers, generators and large end-use consumers to have access to a market place which provides them sufficient liquidity to effectively and efficiently hedge their particular physical electricity exposures.

'liquidity' in the sense of "trading liquidity" reflects the ability to transact quickly without exerting a material effect on prices.²

Our conversations with niche retailers and major users indicate that the ability to execute transactions of this size (5 MW) across a three year price curve, with the expectation of a locational hedge instrument as is currently being worked on by the Commission, would meet their needs.

Ministerial Review

The Ministerial Review has delivered a number of decisions to improve the function of the electricity hedge markets in New Zealand. We agree that the improvements delivered by the Ministerial Review will improve access to hedge products and competition, but have a few additional comments and observations that should be also be considered in any final market design.

While we concur with the Ministerial Review that the use of a futures market based instrument is the best arrangement for developing the hedge market we believe that its application presents some issues particularly for major users. This is due to the futures product being a wholesale instrument, that requires constant settlement and administration, and it being largely incompatible with the '20th of the month' type cashflow management approaches generally employed by corporate and industrial end users.

The Ministerial Review accepted the recommendation of the ETAG in establishing a 3,000 GWh unmatched open interest liquidity test. The Ministerial Review response to submissions provides a logical description of how the 3,000 GWh value was derived. Notwithstanding our views on unmatched open interest, we believe this number is both too high and also too low.

As it is a measure of open interest across the duration curve, it is possible that transactions that ordinarily were executed on an over-the-counter basis will be transitioned to a futures basis to count within the liquidity limit. Examples of these transactions include inter-generator plant outage cover, inter generator basis risk (locational swaps) transactions and potential the virtual State Owned Enterprise asset swaps identified within the Ministerial Review. The ability to easily achieve this 3,000 GWh limit through the restructuring of existing transactions does not in our view promote market confidence or liquidity. The Commissions existing disclosure rules ensures that these transactions are transparent and in our view little is gained by moving them to an exchange where they are crossed essentially off market and settled via the clearing mechanism.

Conversely, if all these transactions are excluded from any calculation of unmatched open interest then the volume of trading would be an order of magnitude greater than currently seen. In our view neither of these outcomes are useful.

² Governor Kevin Warsh, At the Institute of International Bankers Annual Washington Conference, Washington, D.C. March 5, 2007. <http://www.federalreserve.gov/newsevents/speech/warsh20070305a.htm>

Given the emerging nature of a futures based electricity hedge market in New Zealand it seems, at least in the initial couple of years, that a more direct measure of market liquidity would be more appropriate. Especially as the entry of important secondary (i.e. not market maker) traders like the banks will be potentially subject to some delay as product approvals are sought.

Whats Achievable?

The development of an futures based, sufficiently liquid (minimum 5MW bid and offer) market, over the nodes that emerge as input points into the Commissions locational hedging regime is recommended. The size of the contract should be retained at 0.25 MW unless a useful mechanism to bifurcate a larger trade into smaller elements for the use of smaller or emerging retailers can be designed³. Market maker obligations should only extend extend to three years, although the market may extend for longer durations on a voluntary basis. The reloading of prices back into the market, unless subject to a pressure release mechanism, should be immediate - i.e. within 60 seconds of a price being executed. Trading periods on the market should be on a business day basis with the 'hot hour'⁴ method, as currently employed by EnergyHedge, a useful starting point.

Electricity Commission

While all of the elements within the Market Development Programme will have an impact on the development of a liquid electricity hedge market; the management of locational risk and scarcity pricing will have the most material impact. The introduction of a locational pricing mechanism is a vital element in the development of a liquid, effective and efficient hedge market. The development of a hedge market strongly complements the work being progressed on locational price risk, it is not a substitute for it. Assuming that there is no abandonment of a nodal, or comprehensive zonal, market, the hedge market will continue to languish without a locational risk management framework like that currently being considered by the Commission.

The Commission is well placed to continue to overview key elements of the hedge market:

- Overview of and interaction of over-the-counter and futures volumes and trading - especially as it relates to the management of prudential exposures.
- Overview of market maker obligations - in the event that Energy Hedge self regulation provides inadequate.
- Market information disclosure - the markets work on complete and constant disclosure on hedge market price sensitive information - this is a role that could be provided by the Commission (outages, failures etc).
- Overview of extreme trading conditions (including when pressure valves are tripped)
- Overview of Hedge Market related 'Undesired Trading Conditions'

With appropriate sanctions for non performance.

Take Aways

The following take aways are therefore recommended as being noted by the Commission.

- Liquidity reflects the ability to transact quickly without exerting a material effect on prices.
- The recommendations of the Ministerial Review as they relate to hedge market design are considered to be sensible and are likely to have the effect of increased liquidity in the hedge market.

³ A smaller (i.e. 0.1 MW) contract is assessed as being too small and too expensive to administer to be useful.

⁴ Trading for an hour each day - currently Wellington and Auckland businesses days 11am to noon NZT.

- The test (measure) being applied to the development by the industry of a market (3,000 GWh of unmatched open interest) is in our view an inappropriate measure of liquidity in this context.
- The use of a more direct test of market liquidity and associated market depth is recommended instead.
- The development of a futures based instrument will necessitate financial intermediaries (i.e. banks) to enter the market and offer 'end-user friendly' products.
- A 5 MW (each side) 3 years futures curve (with liquidity underwritten by the 5 large generators) available at off take nodes corresponding with the development of a locational pricing regime is considered to be sustainably achievable within the New Zealand context.
- The Australian hedge market, due to its structural differences (e.g. lack of vertical integration and scarcity pricing regime) and the relatively poor credit standing of some of its largest participants, is a poor comparator for the New Zealand hedge market.
- The Commission has an important role to play in the development of the wholesale market which have a direct impact on the development of a liquid hedge market. The delivery of a locational pricing framework and consideration of scarcity pricing are two obvious examples.
- We consider the Commission has an important role to perform in the overview of hedge market arrangements, especially those relating to the interaction of hedge market arrangements with the wider wholesale market.

Market Liquidity

A description of what can be achieved in the New Zealand market is provided together with a definition and interpretation of what is meant by the term 'liquidity' or 'liquid'. We believe this is a useful starting point given the confusion around these terms and the application to New Zealand electricity hedge markets.

Liquidity?

Market participants have grappled with the vexed issue of hedge market 'liquidity' for over ten years; the enquires into the 'dry year' events of 2001 and 2003 and this Work book-end the decade on this issue. While there are many good academic articles⁵ devoted to the measurement and description of liquidity, for our purposes the following generalisations and associated definitions can be made.

'liquidity' in the sense of "trading liquidity" reflects the ability to transact quickly without exerting a material effect on prices. Liquidity is optimally achieved when myriad buyers and sellers are ready and willing to trade. The trading is enhanced by market-makers and speculators alike. Underlying this concept is that while buyers and sellers have different views on the most likely outcomes—that is, after all what generates trading—they largely can agree on the distributions of possible outcomes for which they demand risk-based compensation.⁶

Therefore liquidity can be defined as the volume of transactions that can be absorbed within a market at a given time without materially changing the price. This is related to the concepts of market depth [which can be described as the units of liquidity for a given cost] and breadth or spread [cost per unit of liquidity]. The depth of the market is generally a function of the number of market participants, the greater the number of market participants the greater the depth and therefore the greater the market liquidity. To facilitate trading it is important to make the trading instrument as 'vanilla' as possible; on a popular market platform; with low barriers to market entry to attract the greatest number of trading participants. Increased participation will result in greater market depth and liquidity. It should be noted that the provision of liquidity has a real cost for those market makers obligated to constantly provide volumes at fixed prices into the market, the cost being at least the cost of selling the same volume into an available market segment.

Liquidity has been expressed also a measure of market confidence, again from Warsh.

Liquidity is confidence. That is, powerful liquidity in the U.S. capital markets is evidenced when the economic outcomes are believed to be benign. When the "tail" outcomes are either highly improbable or, at the very least, subject to reasonably precise measurement, the conditions are ripe for liquidity to be plentiful. ... If unmoored from fundamentals, confidence can give way to complacency, complacency can undermine market discipline and liquidity can falter unexpectedly. If, to the contrary, confidence is justified by real economic determinants, liquidity can flourish.⁷

Therefore the development of independent rule based mechanisms for the trading of electricity hedge contracts will also improve liquidity.

⁵ See Polimenis, V; A Realistic Model Of Market Liquidity And Depth, Journal of Futures Markets, Vol. 25, No. 5, 443–464 (2005)

⁶ op. cit. Warsh

⁷ Ibid

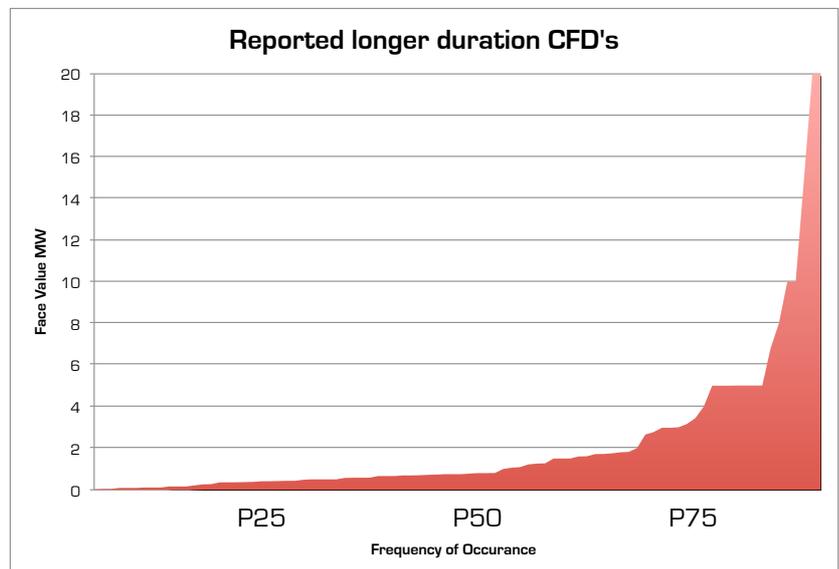
How Much is Enough

Within the New Zealand electricity context, there is a clear need for market participants, particularly retailers, generators and large end-use consumers to have access to a market place which provides them sufficient liquidity to effectively and efficiently hedge their particular physical electricity exposures. In addition to those with a material need to hedge physical risk, are those parties that want access to liquidity. This is to either offer hedging products (often repackaged more appropriately for less sophisticated customers) to their clients or purely for speculative reasons.

The level of market liquidity which can reasonably be expected should be a margin above that required to satisfy the 'needs' of existing, potential and prospective participants. The level should go some way to also providing liquidity to satisfy the requirements of those that 'want' market liquidity.

We have some insight into the volume, duration and size of transactions currently utilised in the over-the-counter (OTC) market from the Electricity Commission's mandatory hedge reporting requirements and the results of successive hedge market surveys conducted for the Electricity Commission. The chart in Figure 1⁸, illustrates the distribution of volumes of contracts for difference (CFD), showing that over 90% of hedges reported to the commission of this type had a face value of under 5 MW, with a mean value of less than half this volume.

Figure 1: CFD Contract Sizes



Our conversations with niche retailers and major users indicate that the ability to execute transactions of this size (5 MW) across a three year price curve, with the expectation of a locational hedge instrument as is currently being worked on by the Commission, would meet their needs. The expectation that an end user or trader with an exposure considerably larger than its peers being able to instantly cover its position through a market of this type is not realistic. In other markets, like the liquid foreign exchange market, materially large participants are required to 'work their exposure through the market' over an extended time period to give effect to a hedge. By way of example, the standard contract volume in the NZD foreign exchange market is less than 0.01% of the Fonterra Co-operative Group Limited annual market position. Our observations however are that a large number of end users in the electricity market remain in a procurement This reality makes the movement of electricity price risk management activity from being an electricity procurement mind set, as opposed to a treasury risk management function, which a liquid hedge market better facilitates.

Our conclusion is that a 5 MW curve (buy and sell) offered on an exchange as a futures based product could reasonably and sustainably be achieved in New Zealand electricity.

⁸ Derived from data from <http://www.electricitycontract.co.nz> retrieved on 26 January 2010.

Decisions Following the Ministerial Review

Opening Comments

The recommendations and analysis conducted by the MED and ETAG to support the decision made by the Cabinet and announced by the Minister of Energy and Resources on 9 December 2009 are considered by us to be of a very high standard. The broad prescription of the recommendations as they pertain to hedge market development are supported, however we do have some recommendations for the improvement of policies relating to hedge market development and some extensions of their recommendations at a level of detail greater than their mandate. We would also note that on many occasions the ETAG reports⁹ identify and provide commentary on the issues we describe in more detail below.

Background

In March and April 2009 the Minister of Energy and Resources instigated an independent review of the New Zealand Electricity Market with the objective of improving electricity market performance. This process culminated in the acceptance by the Cabinet of a range of measures designed to, amongst other things, improve prices, costs and competition. The paper describing these measures was released on 9 December 2009¹⁰, with legislation expected to be passed to give effect to these measures by October 2010. While some of the measures are currently presented with the clear intention that incumbents will deliver on reform without the need for regulation, the Minister has retained flexibility¹¹, so that if reforms are not developed in accordance with these measures then the Minister will have the power to develop specific rules in regulation to give them effect.

The measures introduced by the Minister as they directly relate to the development of a liquid electricity hedge market in New Zealand can effectively be distilled into three key issues, specifically:

- The proposed standardised, tradable contracts, with a clearing house, low entry requirements and transaction costs are a prescription for an exchange traded futures (ETF) contract.
- The requirement for Market Makers to price risk on a two-way (buy and sell) basis with a maximum (10%) spread.
- A measure of 'satisfactory market liquidity' to ensure compliance. Currently this is indicated to be 3,000 GWh of 'unmatched open interest'.¹²



The screenshot shows the official website of the New Zealand Government (beehive.govt.nz). The page displays a news article titled "Energy sector transformation to benefit consumers" by Gerry Brownlee, dated 9 December 2009. The article discusses a suite of changes to the electricity system aimed at improving competition and constraining price increases. The left sidebar contains navigation links such as Home, Releases, Speeches, Features, Newsletters, Image Gallery, News Feeds, and Archives. The main content area includes a search bar and a list of related news items.

Implications of having a Futures based Hedge Market

While we concur with the Ministerial Review that the use of a futures market based instrument is the best arrangement for developing the hedge market we believe that its application presents

⁹ Improving Electricity Market Performance. Volume 1 & 2 by MED and ETAG August 2009

¹⁰ Ministerial Review of Electricity Market Performance 2009 - Summary of key decisions. Hereafter referenced as Ministerial Review and the relevant decision number (#). http://www.med.govt.nz/templates/MultipageDocumentTOC_42290.aspx

¹¹ Ministerial Review, Decision 15.

¹² Ministerial Review, Decision 4.

some issues particularly for major users. The Ministerial Review and the development aspirations of the EnergyHedge grouping appear to be progressing with the development of a futures based instrument. Futures contracts are a useful wholesale trading instrument used widely in a range of markets around the world, they are designed to reduce credit exposures (down to intraday levels) and therefore can be universally used.

To reduce credit exposures the platform (exchange) facilitating trading and an associated clearing house require profits and losses to be monetised on a regular (daily) basis. This process known as 'margin calls' therefore requires counterparts to be able to deposit or maintain funds equal to market losses on a much more regular basis. As the ETF product is a wholesale instrument that requires constant settlement and administration it is incompatible with the '20th of the month following' type cashflow management approaches generally employed by corporate and industrial end users. This is not to say that corporate and industrial end users couldn't utilise such an instrument, but experience with other futures instruments in the New Zealand financial markets (i.e. the bank bill contract) would suggest direct use is highly unlikely¹³. We have provided a basic schematic of forward and futures contracts/markets in Appendix Two for reference.

The ability for the market to attract financial intermediaries (e.g. like the four major banks in New Zealand, global investment banks or other large financial institutions) therefore becomes important for the delivery of products to less sophisticated market participants. The participation of the banks also becomes important to the development of market liquidity. Given the approval times for new products within financial institutions can be quite long (over twelve months) the process of engagement with these parties should be prioritised by those developing the market.

We consider that small or emerging retailers if sufficiently capitalised will see the ETF contract as a welcome addition to the tools available in managing wholesale price risk. The ability to use these instruments as an offset for other prudential requirements will be an important addition for this group of market participants, as will the integration of the products into an effective and efficient locational hedging framework. The large generators have the capacity to engage within a futures based market, as Market Makers, almost immediately. The introduction of smaller generators, less than 500 MW of installed capacity, in the futures market would also be likely where generation is fairly predictable (e.g. co-generation, geothermal, other thermal and run of river hydro).

The ETF contract therefore will have utility for all market participants; recognising that for corporate and industrial (and less financially sophisticated) consumers this will be via an intermediary like a bank.

Interpolation of Australian Market Conditions

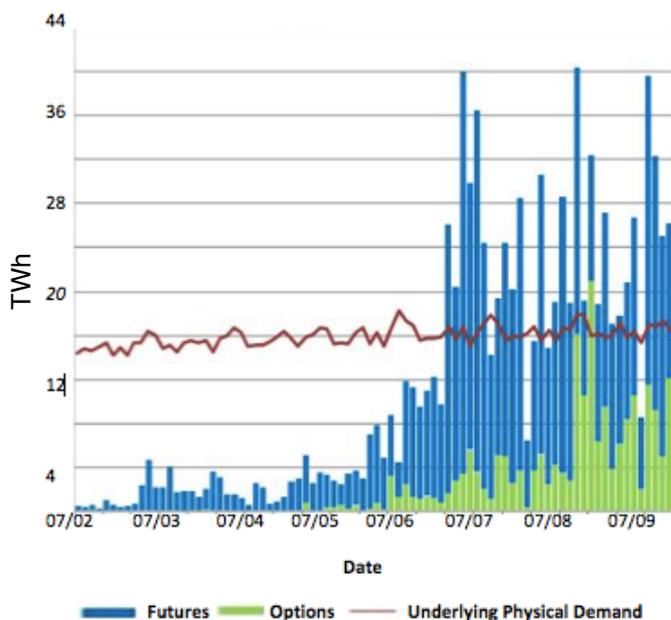
We note that a number of parties, including the ETAG have referenced Australian National Electricity Market (NEM) participants utilisation of the SFE/ASX electricity futures contract as an example of a functioning electricity hedge market. Indeed the increase in utilisation of NEM futures contracts from 2006 provides an impressive backdrop to our own hedge market performance under the Energy Hedge environment – see Figure 2.

Source: ASX

Notwithstanding this, we would recommend considerable caution in the use of NEM futures as a reference point for the New Zealand hedge market environment, as a number of structural and

¹³ Some very large consumers like New Zealand Aluminum Smelters and those with large commodity trading capacity like Fonterra may be exceptions. Corporate utilisation of the liquid New Zealand 90 Day Bank Bill Contract is almost non-existent.

Figure 2: ASX NEM Derivatives Volumes



commercial elements make comparisons unhelpful - particularly as it relates to liquidity.

The traditional separation of retailing and generation activities in the NEM, and therefore a lack of vertical integration, has necessitated the use of both over-the-counter (OTC) and futures (ETF) based products to manage volumetric risks. The extreme peaks¹⁴ observed in the NEM have also had the effect of encouraging the buy side (retailers and end users) to maintain a strongly hedged position. The relatively weak

credit standing of a considerable volume of parts of the sell side (Australian generation capacity¹⁵ including Babcock & Brown Power, International Power) and the limited financial resources of some retailers¹⁶ strongly encourage the use of futures products to manage credit risk. The trend to vertically integrate generation and retailing within the Australian electricity market continues today, as another method to manage volumetric risks. Contributions to this trend from New Zealand companies are also evident (Contact Energy's sale of retailer Red Energy to generator Snowy Hydro in 2004 and Meridian Energy's sale of generator Southern Hydro to retailer AGL in 2005).

The market growth expectation in the design of a New Zealand ETF based trading market appears to have been interpolated from the experience of the Australian NEM futures markets¹⁷.

We are of the belief that the particular features of the Australian market, and most particularly the industry structure (relative lack of vertical integration) and credit standing of some large participants, makes this an unhelpful benchmark.

3,000 GWh Limit

The Ministerial Review accepted the recommendation of the ETAG in establishing a 3,000 GWh unmatched open interest liquidity test. While the suitability of the unmatched open interest test is discussed in a subsequent section, the appropriateness of the 3,000 GWh value is discussed below.

¹⁴ The Australian NEM has a scarcity pricing mechanism that can, and does, see prices being set at the value of lost load (VOLL). Currently VOLL is set at \$10,000/MWh. For example South Australia recorded around 5.5 hours of extreme prices (around \$9-10,000/MWh) during high temperatures in South Australia on 8 and 11 January 2010.

¹⁵ <http://www.theage.com.au/business/vultures-circle-wounded-bbp-but-where's-the-cavalry-20091118-immz.html> and <http://www.ipplc.com/ipr/news/press/pr2009/2009-11-11/>

¹⁶ The recent failure of JackGreen a retailer with 70,000 customers due to high peak prices during the late spring is an example of these issues from the retail perspective. <http://www.smartcompany.com.au/retail/20091222-energy-company-jackgreen-collapses-due-to-heat-wave.html>

¹⁷ Improving Electricity Market Performance: summary note on recommendations taking account of submissions. October 2009. page 77. <http://www.med.govt.nz/upload/71002/Summary-note.pdf>

The Ministerial Review response to submissions provides a logical description of how the 3,000 GWh value was derived. Notwithstanding our views on unmatched open interest, we believe this number is both too high and also too low.

As a proposed measure of open interest across the duration curve, it is possible that transactions that ordinarily were executed on an OTC basis will be transitioned to an ETF basis to count within the liquidity test limit. Examples of these transactions include inter-generator plant outage cover, inter generator basis risk (locational swaps) transactions and potentially the virtual State Owned Enterprise asset swaps identified within the Ministerial Review. The ability to easily achieve this 3,000 GWh limit through the restructuring of existing transactions does not in our view promote market confidence or liquidity. The Commissions existing disclosure rules ensures that these transactions are transparent and in our view little is gained by moving them to an exchange where they are crossed essentially off market and settled via the clearing mechanism.

Conversely, if all these transactions are excluded from the unmatched open interest test, then the volume of trading would be an order of magnitude greater than currently seen across Energy Hedge and ASX.

In our view neither of these outcomes are useful.

Market Maker Requirements

The use of a mandatory market maker arrangement is in our opinion a sensible and credible method to seed and maintain liquidity into the market. This requirement should be sufficient to 'underwrite' minimum levels of market liquidity and also sufficiently large to encourage market makers to encourage other participants to enter the market and relieve them of this constant burden. The 10% spread promoted in the Ministerial Review is sensible.

The 500 MW capacity limit for generators to be market makers¹⁸ is likely to be onerous for a participant like TrustPower. The degree to which different generators have different liquidity requirements is something that we presume will be worked through as part of the EnergyHedge Limited development of the hedge market.

Open Interest as a Measure of Liquidity

The use of open interest, including unmatched open interest, as a measure of liquidity within ETF markets is commonly applied around the world. Strictly speaking it is not a measure of liquidity itself, but a second order measure of trading occurring presumably as a result (or not) of market liquidity. Given the emerging nature of an ETF based electricity hedge market in New Zealand it seems, at least in the initial couple of years, that a more direct measure of market liquidity would be more appropriate. Especially as the entry of important secondary (i.e. not market maker) traders like the banks will be potentially subject to some delay as product approvals are sought.

Appendix One of this report has been provided as an example of a trading report or screen on a mythical contract to illustrate the calculation of 'unmatched open interest'. The graphic promotes an alternative measure, 'open tradable volume' for each contract, providing detail on how much volume (in MW) is available on the bid (buy) and the offer (sell) side of the market within the mandatory market maker spread of 10%.

Appendix One also includes an example of a transaction traded bilaterally but settled through the futures exchange refer 'off market generator trade'.

¹⁸ Ibid p77-78

The inclusion of these trades into the assessment of 'unmatched open interest' doesn't assist in the measurement of liquidity. Furthermore, the potential inclusion of existing bilateral trades between generators and in the extreme mandated virtual asset swaps severely compromises this as a measure of liquidity in the near term.

In summary we can best characterise the unmatched open interest measure as a measure of market 'churn' and the 'open tradable volume' as a measure of 'availability'. We would argue that in the first instance availability is a useful measure and only when new market participants are educated in the ETF instrument and receive the requisite approvals to trade then a movement to a more traditional churn measure would be appropriate.

Recommended Market Characteristics & Improvements

Sustainable Market Design

The sustainable design of a well functioning electricity hedge market is an objective that should be at the heart of future reforms to the market. Care should be taken with design features to reduce the risk of eroding market confidence, and therefore liquidity.

The pursuit of liquidity, as an objective in and of itself, is an example of a design feature that could have unintended consequences. As an example, the regulators of US energy markets are grappling with the challenges of removing market liquidity, in an attempt to decrease the impact of large speculative interests (and resulting increasing volatility) in strategic markets such as oil and natural gas.¹⁹

Increased market liquidity will attract new traders with speculative interests to the market, this will have the benefit of deepening markets for the benefit of all but also may increase market volatility, particularly during periods of market stress. Undoubtedly during periods of market stress the role of speculative interests in the market will be questioned, as although this group bring additional liquidity and volatility - unfortunately they are not always in equal measure. Initially this may expose poor electricity risk management practice in both buy side (end user and retailer) and sell side (generator) camps, but should increase the quality of risk management practice within the industry. The transition from a risk management environment where assets are priced to an environment where financial risk, independent of asset ownership, is priced will take some time to occur. Improvements in market discipline and risk management practice will also increase market confidence.

The functioning of the market during periods of stress (i.e. during dry year events) has previously been a area of considerable interest to market commentators, participants and officials. The design of 'pressure release valves' within the market during periods of stress should be incorporated to reduce volatility and maintain market confidence during these periods.

The selection of a trading platform and clearing regime should be done with a view to maintaining market confidence, attracting secondary traders and keeping transaction costs to a level that does not provide a barrier to entry for smaller participants. The integration of the ETF product within the wider markets prudential security regime is also recommended.

Improvements

As we have previously identified the market design as promoted within the Ministerial Review is supported by us as an effective and useful mechanism to improve outcomes in the hedge market. Consistent with the brief of the Ministerial Review the report did not detail the market design elements over and above the use of an ETF product, market makers and a measure of satisfactory liquidity. We have attempted within this section to extend this prescription into a framework that could reasonably be achieved within the New Zealand context.

The development of an ETF based, sufficiently liquid (minimum 5MW bid and offer) market, over the nodes that emerge as input points into the Electricity Commissions locational hedging regime is recommended. The size of the contract should be retained at 0.25 MW unless a useful mechanism to bifurcate a larger trade into smaller elements for the use of smaller or emerging retailers can be designed²⁰. Market maker obligations should only extend extend to three years,

¹⁹ <http://www.reuters.com/article/idUSN0525625120090805>

²⁰ A smaller (i.e. 0.1 MW) contract is assessed as being too small and too expensive to administer to be useful.

although the market may extend for longer durations on a voluntary basis. The reloading of prices back into the market, unless subject to a pressure release mechanism, should be immediate - i.e. within 60 seconds of a price being executed. Trading periods on the market should be on a business day basis with the 'hot hour'²¹ method, as currently employed by EnergyHedge, a useful starting point.

The future development of the market should not be at the expense of depth in the core baseload contract - deep and narrow is a better outcome than shallow and wide. Notwithstanding this the future development of a peak load contract²² is something that should be developed in New Zealand. This would be of particular value to current and prospective retailers. The development of a cap product is not recommended until at least there is clarity on scarcity pricing within the New Zealand context.

Table 1: Matrix of Possible Market Features against others.

Element	Cybele	ETAG	EHedge	ASX
Product Type	Exchange Traded Future	Exchange Traded Future	Exchange Traded Forward	Exchange Traded Future
Settlement	Clearing House	Clearing House	Bi Lateral Contract	Clearing House
Face Value	0.25 MW or 1 MW if mechanism for small trades developed.	Silent	0.25 MW	1 MW
Market Makers	5 Gentailers	5 Gentailers	5 Gentailers	1 Participant
Nodes	LRA/FTR Trading Hubs/Nodes	Silent	HAY, BEN, OTA	BEN, OTA
Collective Market Maker Liquidity Minimum	5 MW per side per contract.	Silent	0.25 MW per side per HAY contract.	As per Individual Agreements
Reloading of Prices	Immediate	Silent	Immediate	As per Individual Agreements
Base Load Contract	Yes	Silent	Yes	Yes
Market Maker Obligation Duration	3 Years	Silent	5 Years	3 Years
Curve Duration	5 Years	Silent	5 Years	3 Years
Peak Load Contract	Recommended	Silent	No	No, but in other ASX power ETF
Caps	Not Recommended	Silent	No	No, but in other ASX power ETF
First 24 Month Liquidity Measure	5 MW per side per contract.	3,000 GWh Unmatched Local Interest	n/a	Nil
Post 24 Month Liquidity Measure	3,000 GWh Unmatched Local Interest	3,000 GWh Unmatched Local Interest	Nil	Nil
Trading Hours	1 Hot Hour per day	Silent	1 Hot Hour per day	Business Days 10.30am - 4.00pm
Contract Basis	Quarterly	Silent	Quarterly and Annual	Quarterly

²¹ Trading for an hour each day - currently Wellington and Auckland businesses days 11 am to noon NZT.

²² Once a peak load contract is added to a baseload contract an off peak contract can be derived.

In the following table we have presented our assessment of what is possible in the development of a liquid electricity hedge market, together with the recommendations of the Ministerial Review and the existing EnergyHedge and ASX products.

Linkages with Market Development Programme

Electricity Commission MDP

The Commission is currently reviewing feedback on its MDP received prior to mid December 2009. We have reviewed the elements of the MDP in the form it was consulted on during the last quarter of 2009, specifically the following:

- Transmission pricing review
- Managing locational price risk
- Scarcity pricing and compulsory contracting
- Dispatchable demand

All of the elements within the MDP will have an impact on the development of a liquid electricity hedge market, with the management of locational risk and scarcity pricing having the most material impact. Naturally the specifics of each element is subject to change (or being passed over entirely) and therefore our observations are kept at a high level and confined to the two material elements identified above with fleeting mention of the others²³.

While compulsory contracting is also part of the MDP we note its lack of favour within the Ministerial Review and therefore haven't actively considered its implications on the development of a liquid electricity hedge market. While an ETF based electricity hedge market could be used to facilitate trades between parties with compulsory obligations less elaborate mechanisms would be more appropriate, given this level of intervention e.g. gazetted prices. As market liquidity is often a function of confidence, a mandated approach to hedging is unlikely to result in a confident, and therefore liquid, hedge market.

Locational Price Risk

The introduction of a mechanism to assist in the management of the currently 'unhedgable' elements of nodal price risk would greatly improve the utility of a traded electricity hedge market, as the ability to hedge back to key nodes will further concentrate liquidity into these nodes for the benefit of all market participants. This was noted by the Ministerial Review as it also encouraged the development of a transmission hedging mechanism²⁴.

Subject to the final design of a market arrangement, the development of a locational price risk mechanism could be simply interfaced to the traded nodes of the ETF based electricity hedge market. Such a development would have the benefit of providing direct access to a reasonably effective hedging instrument at individual grid off take points. The degree to which it is effective (as a hedge) will be subject to the performance of the locational price risk management instrument rather than the hedge market. Some care needs to be exercised in the design of the key nodes to either avoid or embrace the establishment of an arbitrage opportunity between the ETF market and a potential (North Island to South Island) Financial Transmission Right (FTR) contract.

The completion of the MDP as it relates to locational price risk management should be a very high priority, with final design being incorporated within into the ETF based electricity hedge market.

²³ While the Ministerial Review makes reference to the improvement of demand side participation in the wholesale market, we haven't examined this issue as it sits on the periphery of hedge market development.

²⁴ Ministerial Review, Decision #8.

Scarcity Pricing

Any market design feature that has the impact of suppressing market prices, naturally reduces the incentives for market participants to undertake risk management, including hedging, activity. The high degree of hedging activity experienced in the Australian context is in part related to the costs associated with being exposed to VOLL pricing. The recent failure of retailer JackGreen due to high spot prices in November of last year, is an example of this need and the implications of not hedging sufficiently.

While not the primary reason to embark upon a scarcity pricing regime, the positive impact on hedge market liquidity make this element of the MDP particularly useful in the development of a liquid electricity hedge market.

Electricity Commission's Role in Market Development

The Commission has maintained a strong leadership role in the development of a liquid hedge market for electricity since its inception. Correctly recognising that the development of a functioning market cannot simply be mandated, the Commission has taken proactive steps to assist with the development of the market through encouraging transparency, education and lowering the barriers to entry. The Commission has also actively engaged with market participants to keep a watching brief on market improvements.

Commission activities that complement the development of a liquid electricity hedge market have included:

- Publication of risk management contract information
- Model Master Agreement
- Centralised publication of outage and fuel
- Regular survey
- Hedge market training providers

We would encourage the Commission to continue to develop and deliver these support activities to the market. Additionally we see roles and functions being important for the Commission.

MDP Development

The previous section has identified the areas of work currently being developed by the Commission as part of the MDP. Naturally the Commission has a role to continue in the development of locational hedging and scarcity pricing market reforms.

These issues are complex and the Commission has developed considerable experience and expertise in the consideration of associated market developments which should not be lost. Therefore we would recommend that the Commission be charged with finishing what has been identified as 'unfinished business' in the initial market design.

Market Oversight

The oversight of market performance in an ETF based hedge market is likely to be initially regulated by the operator of the futures exchange and then by the New Zealand Securities Commission. There is however a significant role for the Commission in the following areas:

- Overview of and interaction of OTC and ETF volumes and trading - especially as it relates to the management of prudential exposures.
- Overview of market maker obligations - in the event that Energy Hedge self regulation provides inadequate.
- Market information disclosure - the markets work on complete and constant disclosure on hedge market price sensitive information - this is a role that could be provided by the Commission (outages, failures etc).
- Overview of extreme trading conditions (including when pressure valves are tripped)
- Overview of Hedge Market related 'Undesired Trading Conditions'

With appropriate sanctions for non performance.

Appendix One: Trading Report Example

Contract 715: Quarter 4, 2013

'open tradable volume'

Line	Counterparty	Volume	Bid	Offer	Volume	Counterparty
1	GenTailer E	1.0	\$50.00	\$55.00	1.5	GenTailer A
2	GenTailer D	2.0	\$49.99	\$53.03	2.0	GenTailer C
3	GenTailer B	4.0	\$49.97	\$55.05	3.0	GenTailer E
4	GenTailer C	1.0	\$49.93	\$55.09	1.5	GenTailer B
5	Industrial A	0.5	\$49.91	\$55.15	6.0	GenTailer D
6	Retailer A	1.5	\$49.89	\$55.20	3.0	Retailer A
7	GenTailer A	2.0	\$49.85	\$55.25	8.0	GenTailer E
8	Retailer B	3.0	\$49.80	\$55.27	6.0	Industrial A
9	GenTailer B	5.0	\$49.76	\$55.30	3.0	GenTailer A
10	Bank B	6.0	\$49.70	\$55.31	8.0	GenTailer B
11	Retailer A	7.0	\$49.58	\$55.50	5.0	GenTailer B
12	GenTailer A	8.0	\$49.55	\$55.41	3.0	GenTailer D
13	GenTailer E	1.0	\$49.35	\$56.10	2.0	GenTailer E
14	GenTailer A	3.0	\$49.20	\$56.70	5.0	Bank A
15	Retailer B	4.0	\$47.25	\$57.90	6.0	Bank A
16	Bank A	5.0	\$45.00	\$60.00	4.0	Bank B
17	Retailer B	1.0	\$35.00	\$72.50	1.0	Bank B

Item	Bought Today	Sold Today	Net Today	Bought Life	Sold Life	Life Net
Bank A	0	1.5	(1.5)	0	4.5	(4.5)
Bank B	0	0	0.0	0	0	0.0
GenTailer A	0	3.0	(3.0)	0	9.0	(9.0)
GenTailer B	4.0	0	4.0	126.0	0	126.0
GenTailer C	1.0	0	1.0	3.0	0	3.0
GenTailer D	2.0	0	2.0	6.0	0	6.0
GenTailer E	1.0	4.0	(3.0)	1.0	126.0	(125.0)
Retailer A	1.5	1.0	0.5	4.5	1.0	3.5
Retailer B	0	0.5	(0.5)	0	1.5	(1.5)
Industrial A	0.5	1.0	0.5	1.5	0	1.5
Sum	10	10	0	142	142	0

Trades Today

Line	Buyer	Seller	Price	Volume	Time	Date	Reference	On Market
1	GenTailer E	Retailer A	\$51.00	1.0	9:57 am	29/01/10	585886	Yes
2	GenTailer D	GenTailer A	\$55.00	2.0	11:14 am	29/01/10	585887	Yes
3	GenTailer B	GenTailer E	\$53.25	4.0	9:57 am	29/01/10	585888	Yes
4	GenTailer C	GenTailer A	\$54.00	1.0	11:14 am	29/01/10	585889	Yes
5	Industrial A	Retailer B	\$49.91	0.5	9:57 am	29/01/10	585890	Yes
6	Retailer A	Bank A	\$49.89	1.5	11:14 am	29/01/10	585891	Yes

Contract Lifetime

Line	Buyer	Seller	Price	Volume	Time	Date	Reference	On Market
1	GenTailer E	Retailer A	\$51.00	1.0	9:57 am	29/01/10	585886	Yes
2	GenTailer D	GenTailer A	\$55.00	2.0	11:14 am	29/01/10	585887	Yes
3	GenTailer B	GenTailer E	\$53.25	4.0	9:57 am	29/01/10	585888	Yes
4	GenTailer C	GenTailer A	\$54.00	1.0	11:14 am	29/01/10	585889	Yes
5	Industrial A	Retailer B	\$49.91	0.5	9:57 am	29/01/10	585890	Yes
6	Retailer A	Bank A	\$49.89	1.5	11:14 am	29/01/10	585891	Yes
7	GenTailer B	GenTailer E	\$57.50	110.0	9:57 am	20/01/10	3291877	No
8	GenTailer D	GenTailer A	\$55.00	2.0	11:14 am	20/01/10	585877	Yes
9	GenTailer C	GenTailer E	\$53.25	4.0	9:57 am	20/01/10	585888	Yes
10	GenTailer B	GenTailer A	\$54.00	1.0	11:14 am	20/01/10	585889	Yes
11	Industrial A	Retailer B	\$49.91	0.5	9:57 am	20/01/10	585890	Yes
12	Retailer A	Bank A	\$49.89	1.5	11:14 am	20/01/10	585891	Yes
13	GenTailer A	GenTailer E	\$53.25	4.0	9:57 am	20/01/10	585888	Yes
14	GenTailer B	GenTailer A	\$55.00	2.0	11:14 am	20/01/10	585889	Yes
15	GenTailer C	GenTailer E	\$53.25	4.0	9:57 am	20/01/10	585888	Yes
16	GenTailer D	GenTailer A	\$54.00	1.0	11:14 am	20/01/10	585889	Yes
17	Industrial A	Retailer B	\$49.91	0.5	9:57 am	20/01/10	585890	Yes
18	Retailer A	Bank A	\$49.89	1.5	11:14 am	20/01/10	585891	Yes

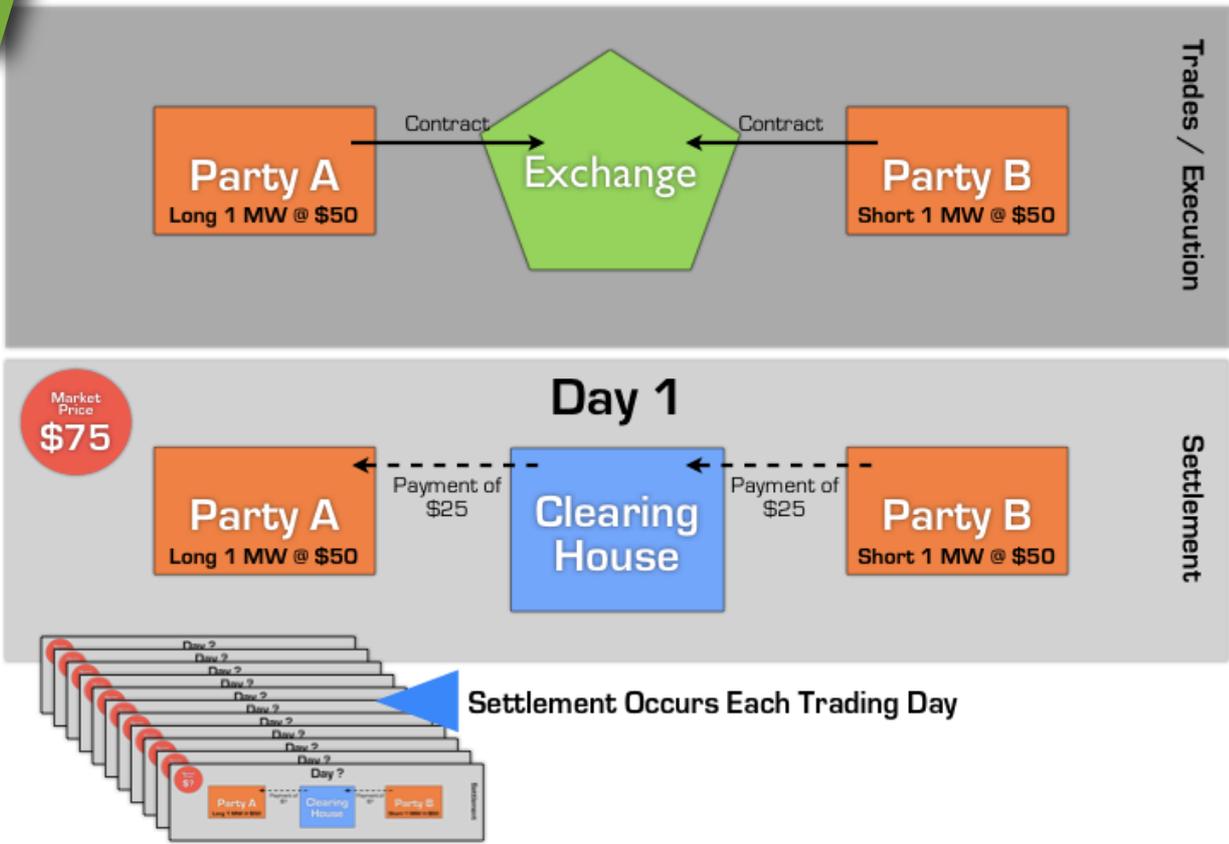
Unmatched Open Int.	Sum
Bank A	0.0
Bank B	0.0
GenTailer A	0.0
GenTailer B	126.0
GenTailer C	3.0
GenTailer D	6.0
GenTailer E	0.0
Retailer A	3.5
Retailer B	0.0
Industrial A	1.5
Sum	140

off market inter generator trade. Included in unmatched open interest.

'unmatched open interest'

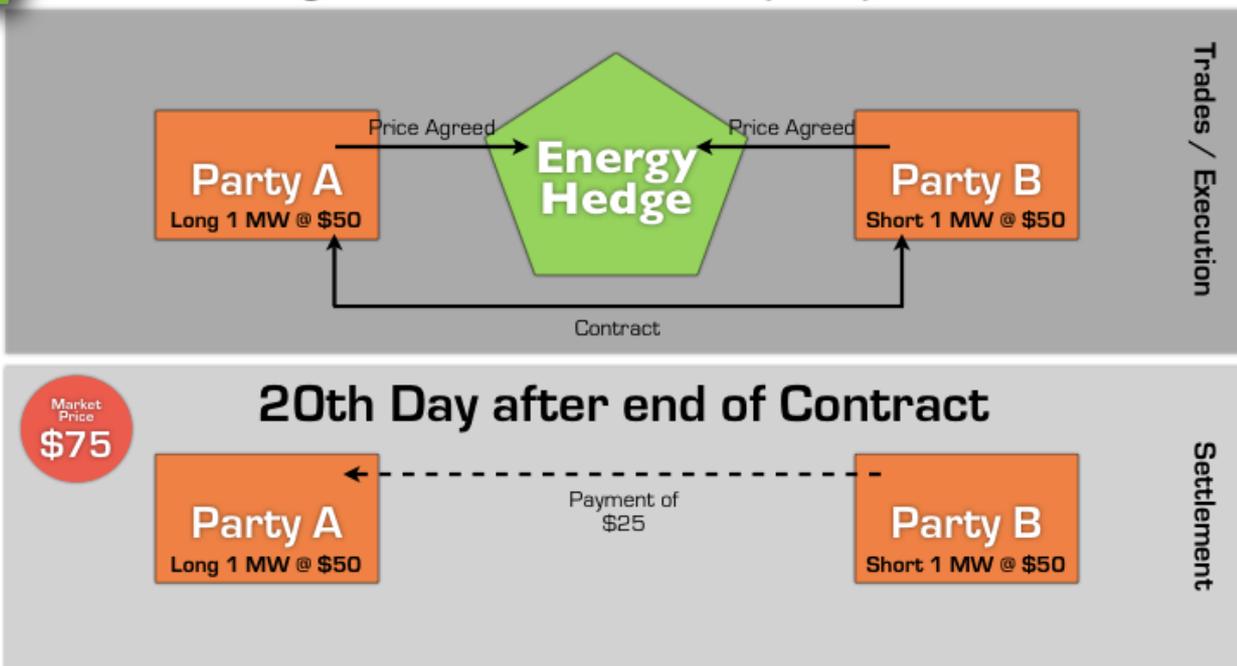
1

Exchange Traded Futures Contract



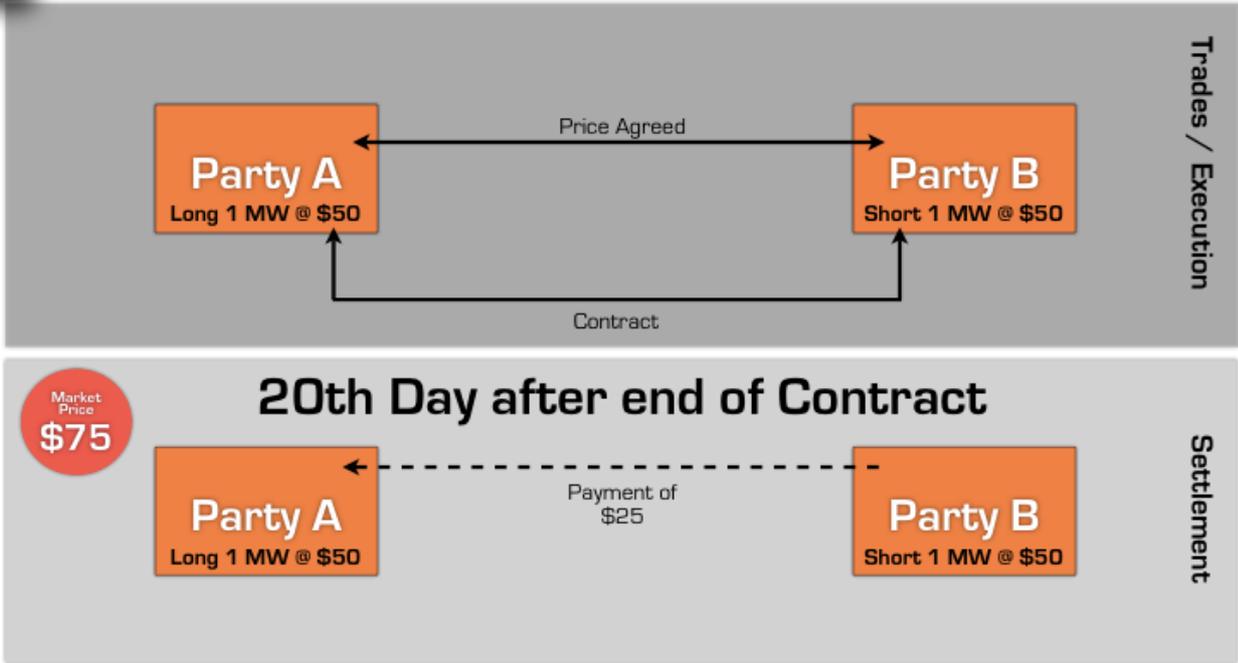
2

Exchange Traded Forward (CfD) Contract



3

Bilaterally Traded Forward (CfD) Contract



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