

Hedge market development

26 November 2014

Why are we here today?

- Provide an overview & update of the Authority's work on the hedge market
 - Authority has three parallel projects on the go:

Parallel projects	2014/15 programme milestones
WAG project	Complete the WAG review of hedge markets and commence design of any Code amendments or market facilitation measures that result from the review.
Offsets project	Explore ASX positions offset energy market prudential security requirements (Code amendment possible in 2015/16).
Market making project	Market making occurring on some new ASX futures products.

Why are we here today?

- Interested in MEUG views about:
 - new ASX products – especially caps
 - how to overcome barriers to members' participation on ASX
 - so we will provide introductory material (30 to 40minutes)
 - then some questions for you to consider
 - followed by discussion

WAG project

- WAG is investigating opportunities to further develop the hedge market
- WAG just released a paper for discussion with stakeholders
 - Still to form a view of the issues and best development options
 - Looking for information / examples / evidence from stakeholders
 - Particularly around:
 - ***The efficiency of hedge prices***
 - *Some large users have previously suggested hedge prices are uncompetitive*
 - *EnergyLink analysis suggests futures prices may be reasonable*
 - ***The extent to which vertical integration inhibits development of liquidity***
 - ***How trading could be made easier/cheaper/faster***

WAG project

- WAG has drawn on:
 - presentations made by small retailers & generators, ASX, OMF, and Cold Storage Nelson
 - 2014 hedge market survey
 - a bunch of its own analysis
 - analysis by EnergyLink
 - Large user perspectives available on the WAG itself
 - ***But useful for WAG to be able to draw on a formal / published representation of 'large user' views***
 - Submissions due 19 December.
 - Briefing to be held on Wednesday 10 December at Authority offices in Wellington
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Offsets project

- Working to identify a way to allow a futures position to offset prudential requirements
- **This could be of significant value to participants**
- **...but it's not a straight-forward problem!**
 - A number of overseas jurisdictions are grappling with this same issue
- AEMO & ASX may have identified a solution
 - Conducting a design study. Expecting some conclusions by end of 2014
 - NZ might be an ideal 'testing ground'
- Clearing Manager (NZX) also looking into possible solutions

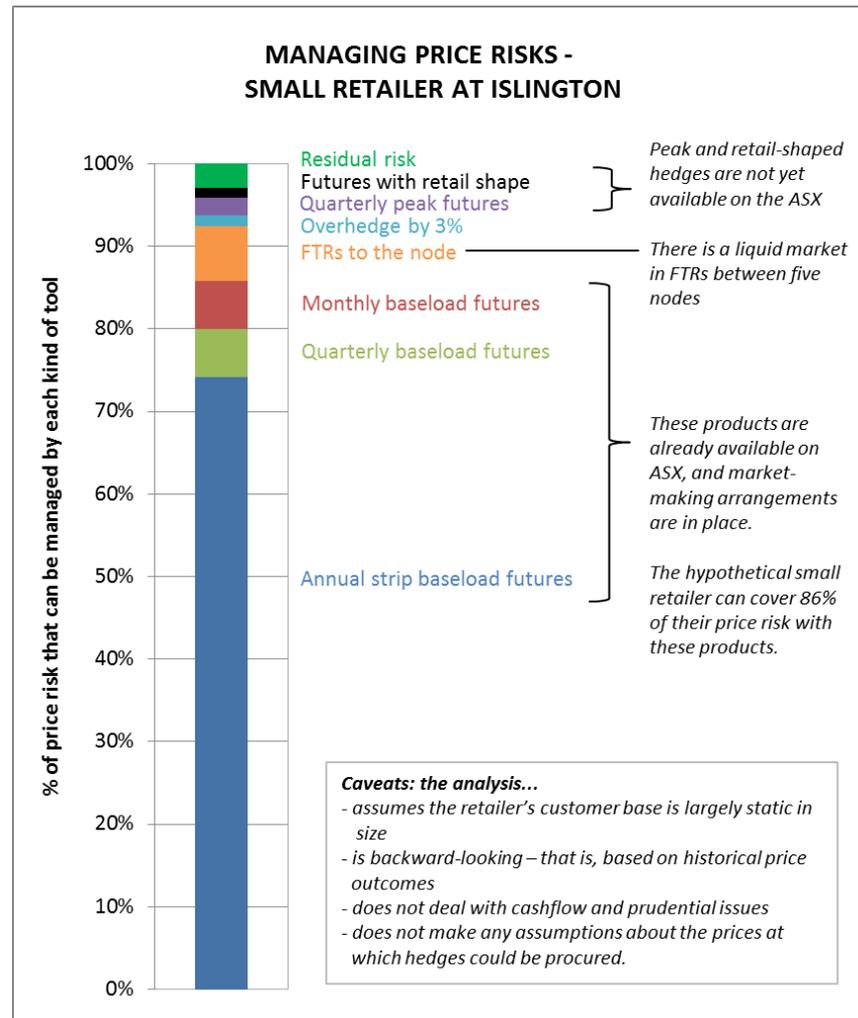
Market making project

- The Authority has been trying to:
 - identify barriers to market making in the ASX peak and option products (including caps)
 - identify whether parties would value other products
- Authority still working with generator-retailers around possibly extending market making
- Authority sees potential value in a half-hour cap product:
 - Some banks have suggested the uncapped nature of the spot market is unnerving for them
 - A cap product on ASX could be an alternative to a cap in the spot market (*which has implications for efficiency and market behaviour*)
 - Useful for anyone that likes to retain the potential for upside but limit their losses

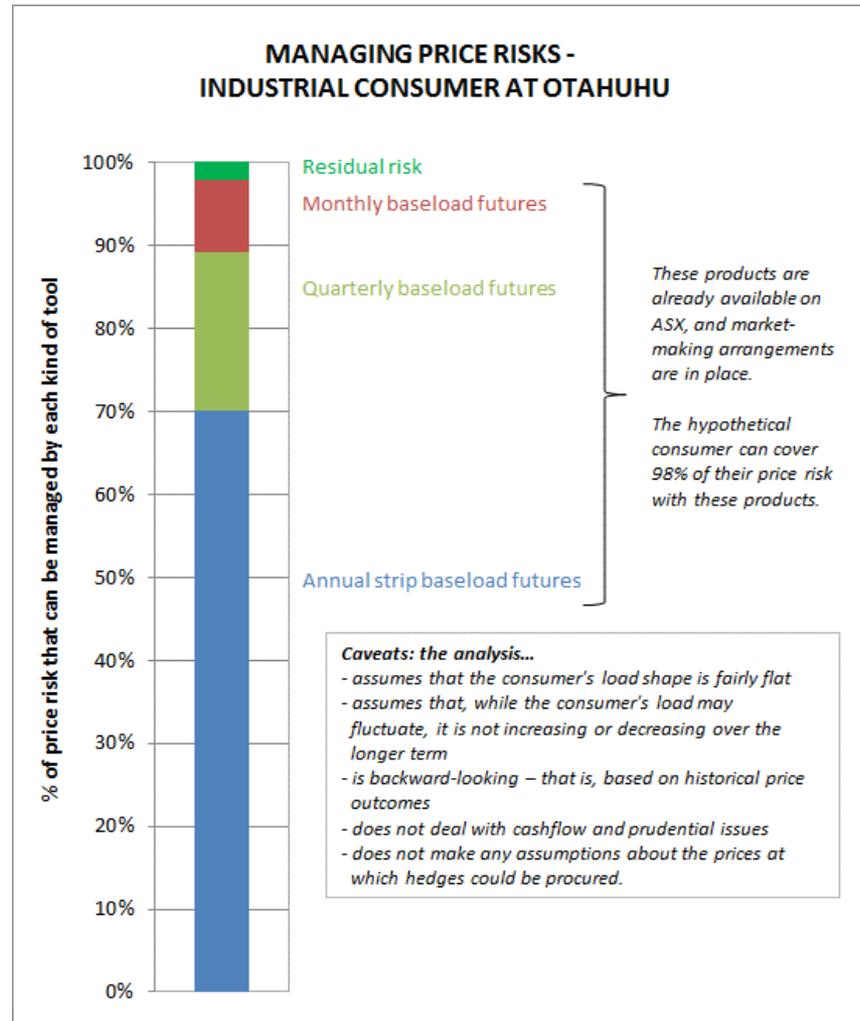
Description of existing and possible products

- How they could allow parties to manage spot price risk

Breakdown of price risk



Breakdown of price risk



Questions on futures and options product range

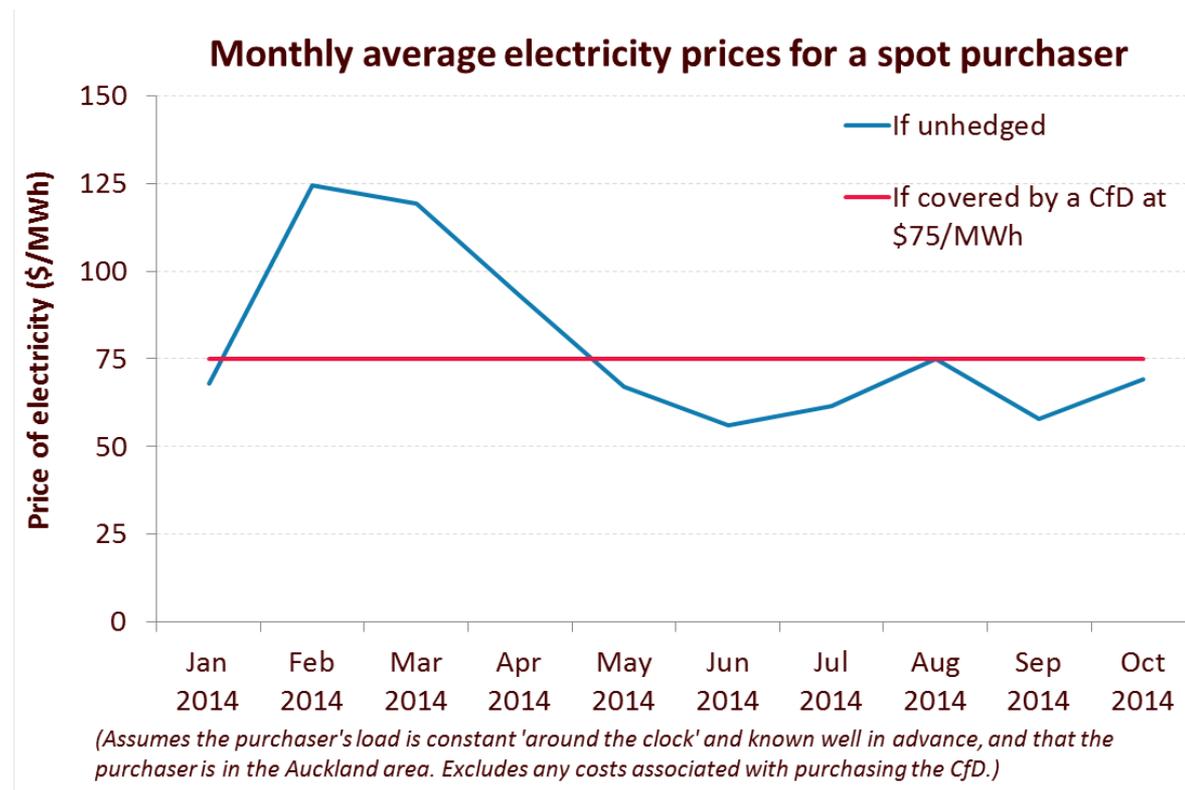
- What products should be introduced?
- What products should be market made?

Futures, options and caps

- OTC contracts one approach for managing spot price risk
 - FPVW, CfD, options etc
 - negotiated arrangements, periodic settlement (e.g. monthly)
 - Another approach is to hedge on the ASX
 - **Futures:**
 - *quarterly/monthly baseload - available, market making arrangements in place, will soon come in a 0.1 MW size*
 - *quarterly peak (7am-10pm business days) – available, but not market-made yet*
 - **Options** – *available, but not market-made yet*
 - **Caps** – *not available, but ASX and Authority investigating*
 - Key difference between OTC and ASX: ASX requires traders to pay margins
 - Initial margins
 - Variation margins
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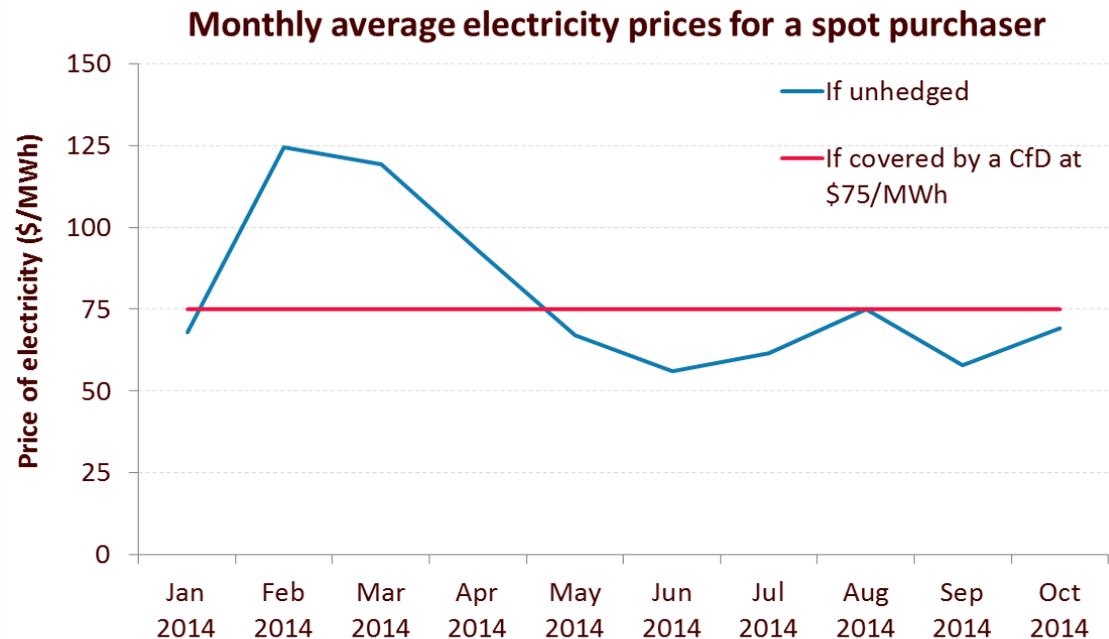
A future is like a CfD

- Suppose Rob buys a CfD for \$75/MWh at Otahuhu for Q1 2015
- If the average spot market price at Otahuhu for Q1 turns out to be \$65/MWh then at the end of March Rob pays the seller \$10/MWh; if the average spot price had been \$80/MWh then the seller would pay Rob \$5/MWh
- In effect, the buyer and seller are agreeing to trade electricity at the CfD price, not the spot price
- May have quarterly, annual and multi-year durations, but the parties typically settle the differences on a monthly basis through the life of the contract



A future is like a CfD

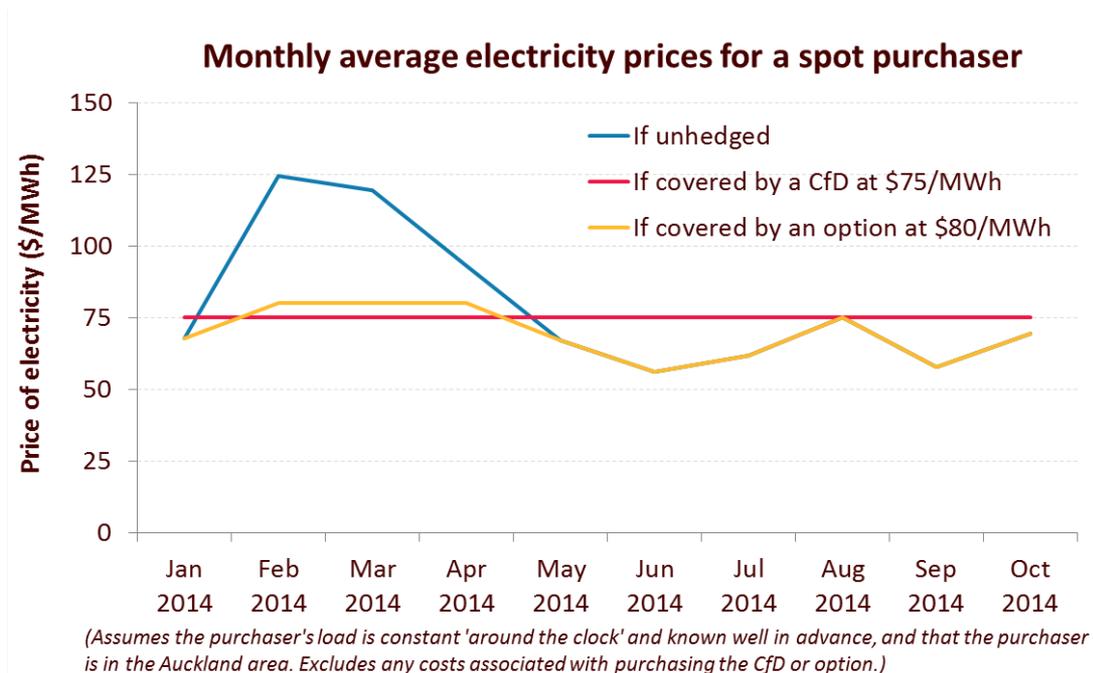
- Suppose Rob buys a future for \$75/MWh at Otahuhu for Q1 2015
- Rob pays an initial margin of (say) 10% of the contract price – i.e. \$7.50/MWh.
- The market price for the Q1 2015 futures contract will change over time, as expectations of its value change. The price should eventually converge on the actual average spot price for that period
- If the average spot market price at Otahuhu for Q1 turns out to be \$65/MWh then by the end of March, Rob will have had to pay \$10/MWh; If the average spot price was \$80/MWh, then Rob would have received \$5/MWh.
- Rather than pay on settlement day, Rob will have paid, or been paid, as the market price for the contract moved over time
- But the net effect is the same as for a CfD



(Assumes the purchaser's load is constant 'around the clock' and known well in advance, and that the purchaser is in the Auckland area. Excludes any costs associated with purchasing the CfD.)

ASX Options

- An option holder will get paid if the quarterly average price is greater than \$X/MWh – but doesn't have to pay if the average price is less
- But they have to pay 'for the privilege'
 - Suppose Rob purchases an option to buy a future for Q1 2015 at \$80/MWh
 - Rob buys the option when it is worth \$7/MWh
 - If the average spot price in Q1 turns out to be:
 - a) \$100/MWh, then by the end of the period, Rob will have received \$13/MWh ($100 - 80 + 7$)
 - b) \$60/MWh, then by the end of the period, Rob will have paid \$7/MWh.
 - If he'd just bought the underlying future, Rob would have received \$20/MWh under (a), or paid \$20/MWh under (b).

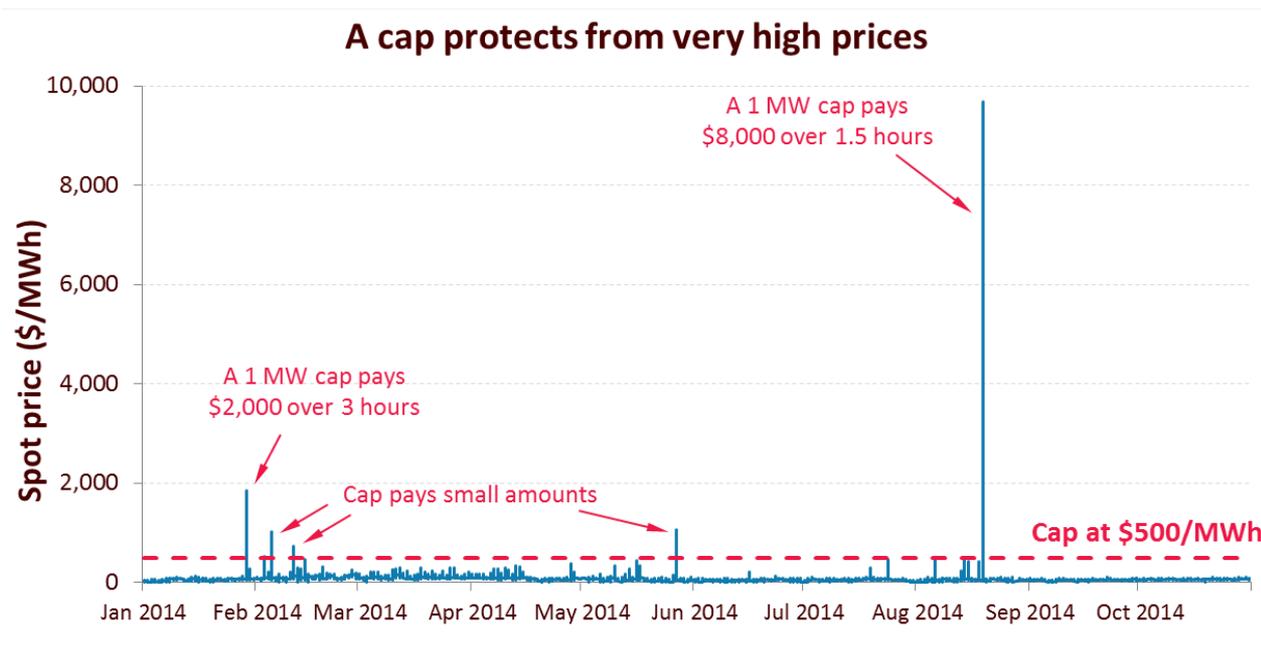


ASX option holders pay margins

- An option holder would need to pay an initial margin
 - Initial margin will always be less than premium
 - Full premium only paid if the cap expires out of the money
- They would also need to pay variation margins as the value of the option changed
 - The value of the option is calculated by ASX, reflecting the *probability* that it will be ‘in-the-money’
 - Rob will have to pay margins as that value changes
 - By the end of the contract period, the value of Rob’s option should equal:
 - a) \$20/MWh if the underlying futures price was \$100/MWh (100% probability that it will be \$20 above)
 - b) \$0/MWh if the underlying futures price was \$60/MWh (100% probability that it will be below)
- Options contracts can be bought or sold
- An option to buy is called a ‘call’ and an option to sell is called a ‘put’

ASX caps

- A cap protects against *half-hourly* spot prices greater than \$X/MWh
 - Suppose Rob buys a half-hourly cap contract for Q1 2015 with a strike price of \$500/MWh
 - The pay-out for the contract is calculated as the sum of $0.5 \times (\text{half-hourly spot price} - 500)$, for all trading periods in Q1 2015 (or zero if negative)
 - In effect, the cap contract provides insurance to Rob against the possibility of high prices
 - Again this comes at a cost

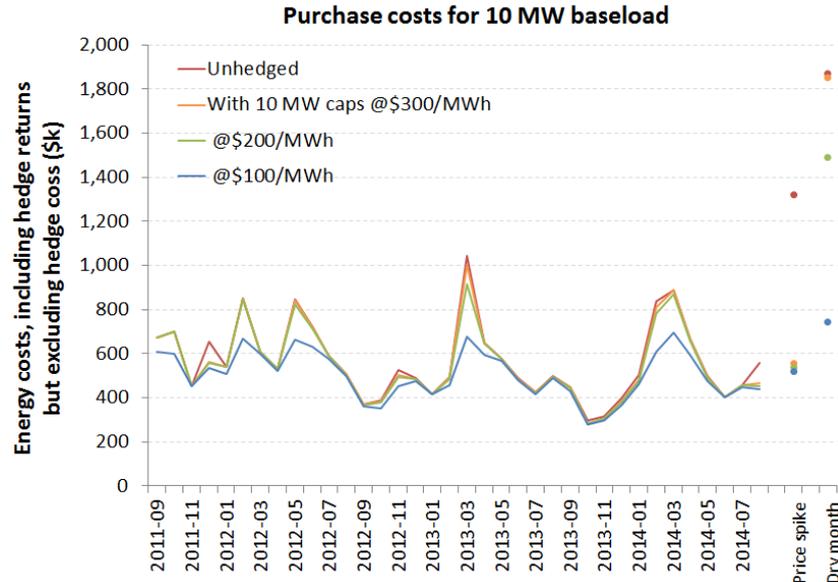


An ASX cap works like a future

- You would need to pay an initial margin (*e.g. 25% of the cap price*)
 - Suppose Rob buys a cap when it is trading at \$7/MWh
 - He must provide an initial margin of \$1.75/MWh
- The market price of the contract will reflect the value of any price spikes that *have* occurred, or that the market expects *might* occur during the contract period
- As the market price of the cap moves up or down, you would receive or pay variation margins:
 - Suppose the market price of Rob's cap increased to \$15/MWh following a price spike - Rob would receive \$8/MWh
 - Alternatively, suppose there were no price spikes during the quarter – then the market price of the cap would eventually fall to \$0/MWh and Rob would need to pay \$7/MWh
- You could expect a cap to lose a small amount of money in most quarters
- But it could save you a larger amount of money in occasional quarters when there were price spikes

The strike price is important

- The lower the cap strike price, the
 - higher the expected pay-out for the purchaser of the cap
 - but also the higher the expected premium the purchaser must pay to buy the cap
- \$100/MWh cap could be expected to pay-out frequently
- \$300/MWh cap is useful against price spikes and dry periods
(NEM has a ASX cap product at this price)
- \$500/MWh cap is mainly useful against more severe circumstances of supply scarcity



What strike price is preferable?

- Would you consider using an ASX cap product?
- If so, would you rather have access to:
 - a relatively expensive cap at \$100/MWh, or
 - a cheaper cap at \$300/MWh, or
 - an even cheaper cap at \$500/MWh?

MEUG views on other barriers

- Previously identified a number of barriers to trading on ASX:
 - ASX unit size too big for some
 - Inability to use futures to offset prudentials
 - Prefer a price at a different node (location risk)
 - Becoming a direct purchaser an involved process
 - Need to get sign-off from the right people in the company – knowledge barriers
 - The high capital requirements and need to monitor daily margin calls
 - Maybe some difficulty accessing data/information?
- **Do MEUG members agree with these? Are there others?**

MEUG views on other barriers

We've made progress on some of these

- ✓ ASX unit size too big for some
 - Unit size decreasing to 0.1 MW (from 1 MW) in early 2015.
 - ✓ Inability to use futures to offset prudentials
 - Progressing offsets work.
 - ✓ Prefer a price at a different node (location risk)
 - Three new FTR nodes now trading. Do these help?
 - ASX futures decreasing to same size as FTRs
 - **Is there more we can be doing?**
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MEUG views on other barriers

Do MEUG members have any experiences they can share regarding difficulties with:

- Becoming a direct purchaser
 - Getting sign-off from the necessary people in the company, in order to trade on ASX
 - Meeting ASX capital requirements and monitoring daily margin calls
 - Accessing data/information
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- **What are the key challenges?**
 - **How can the Authority help to overcome these?**