Reserve Capacity Mechanism Working Group Discussion

Everyone

4 July 2012

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Agenda

- What is the problem? / Is there a problem?
- History
- Options
- Way forward

What is the problem? / Is there a problem?

Setting the scene – some issues currently perceived about the RCM

- Excess reserve capacity currently
  - This might be OK if the costs were not high
- The MRCP review and other reviews have greatly increased uncertainty – changing the RCP value significantly over a short period
- Administered (regulated) mechanism determines price of Capacity Credits that are not traded bilaterally
  - (and may influence bilaterally traded prices or availability of bilateral contracts)
  - What is the basis for value?
- Economic value of excess reserve capacity to consumers (to WA in general) is less than the value rewarded by the RCM
  - What happens when more value is attributed to something than it is worth?
- Retailers cannot hedge exposure to RCM
  - Bear costs associated with excess reserve capacity if they hold bilateral contracts
  - Incentive to minimize bilateral contracts
- Retailers are protected by RCM structure
  - Compared to other forms of capacity market mechanisms elsewhere
- RCM supports investment and works fine
- Resources have too much incentive to invest in the WEM, even when resources are not needed
- Too easy for resources to get credits

Design challenges

- Must work in a small, lumpy market, with relatively highly concentrated stakeholder positions in the retail and generation sectors
- Should avoid the “zero” / “infinity” problem – in which credits are worth nothing when there is too much, and more precious than gold when there is too little
- Should be mindful of costs and risks borne by end-users
- Should have some degree of “self-correctedness” -- should not work against natural incentives
- Should support some degree of reasonable hedging
- Should not discriminate against different types of resources

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Some basic realities

- Excess reserve capacity has value – just as all capacity has value – because it contributes to a reduction in risk of supply shortage
- The economic value (to end users) declines rapidly with more reserve capacity
- End-users should not want to pay any more for excess reserve capacity than it is worth to them
- Capacity and energy together, not just capacity
- If we make end-users pay more for excess reserve capacity than it is worth to them, then we need to be mindful of the risk that we are incentivising excess investment
- If we push risks into the investment environment, we need to be mindful of the risk of reduced investment or higher financing investment costs

History

History (Brendan Clarke)

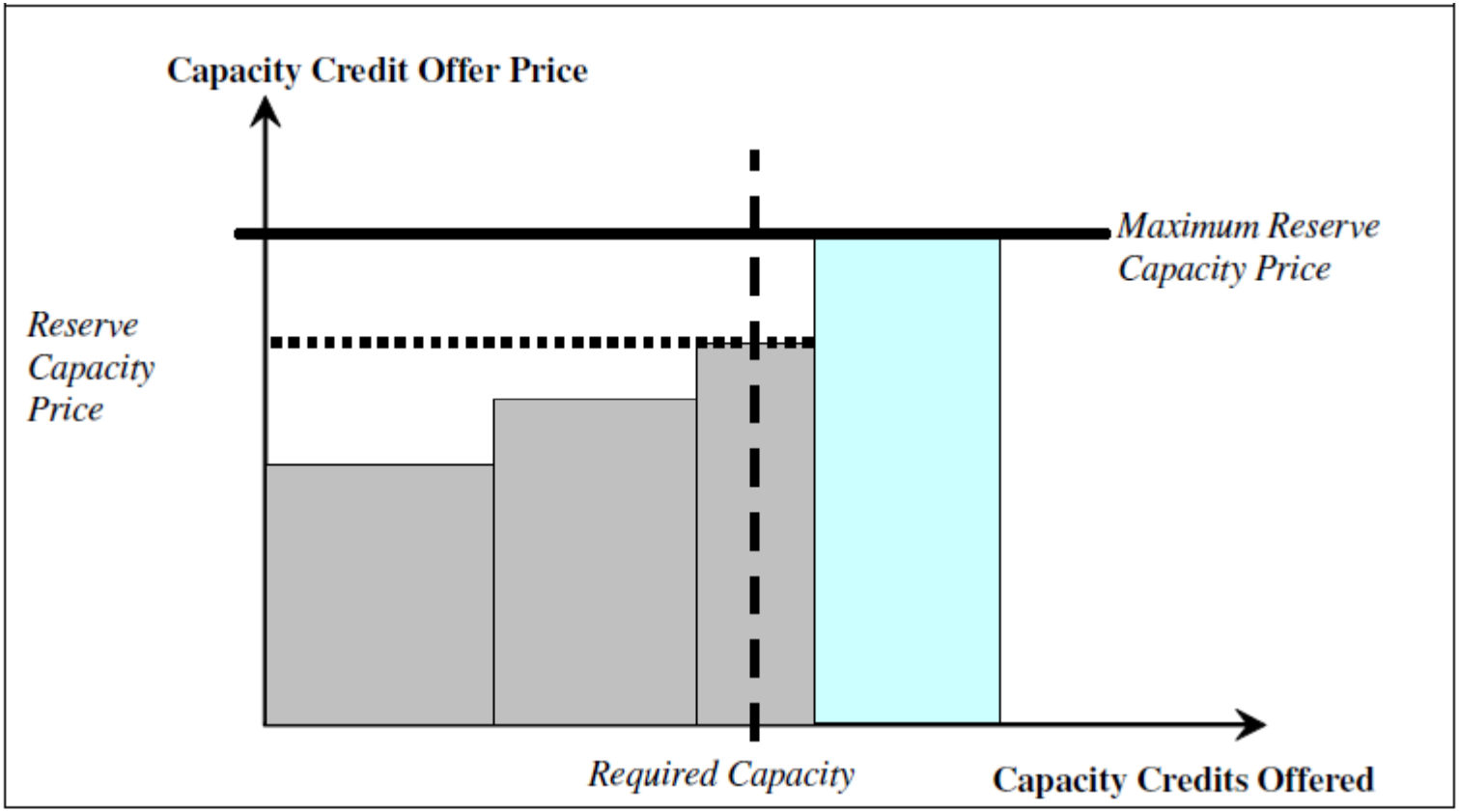
- The incentive for retailers to contract is that they would end up with a high cost solution as they would only be able to buy high energy priced energy from the IMO. The incentive for generators to contract is that they would receive no capacity credits to maintain their investments.

- What was the philosophy if the total capacity procured by the retailers is less than that that would have been procured by the integrated utility forecast?
  - The Reserve Capacity Mechanism was put in place as reliability back stop. (this is my recollection not an opinion from the market designers). This is embodied in the following philosophy
- "The primary role of the Reserve Capacity Mechanism is to ensure that there
  - is adequate generation and Demand Side Management (DSM) capacity available each year to meet system peak demand plus a reserve margin." *Source Wholesale Electricity Market Design Summary*

- The IMO would intervene (run a capacity auction) if the reliability criteria was not met that is total capacity procured by the retailers was less than that that would have been procured by the integrated utility forecast.

History 2

Exhibit 7-1. The Reserve Capacity Auction



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History 3

- “In determining which bilateral trades can contribute to satisfying the required Reserve Capacity, the IMO will generally accept bilateral trades in order of decreasing availability until all trades are exhausted or until the Reserve Capacity requirements are satisfied.” *Source Wholesale Electricity Market Design Summary*

- I suggest that this philosophy means the intent of the RCM is that Capacity offers above the required capacity are not allocated capacity credits. (this is my recollection not an opinion from the market designers)

Some questions for discussion

- Can a generator or demand resource actually “enter” without a commitment to a credit? – How to reconcile the use of an auction with the existence or need for capacity to participate in it?
- Where does market power fit into this picture?
- Does the description of how history was supposed to work comport with the reality of commercial market operation?
- If a resource can provide capacity, why not issue it a capacity credit and let the value be determined in the auction process?
- Why was there a maximum reserve capacity price? What is its purpose?
- What happens if too little capacity is available? Is the supplementary auction enough?
- Who decides what type of capacity (existing vs new) is best suited to provide capacity?
- If capacity exists or seeks to exist because the RCP is attractive, what is the point of keeping the RCP high and preventing entry?

Clean sheet of paper approach

Why not start with a clean sheet of paper

- Open reserve capacity auction – no caps, no floors
- Each year or when needed
- Free to bilaterally contract if, as and when desired
- Full market-based pricing of capacity and free choice of risk management strategy
- Retailers (Load Serving Entities) must demonstrate they hold the right number of credits at end of each period
- No administrative back up or pricing formula

Auction basics

- If there is ample competition and no market power – you don't need caps or floors
- If you are not sure the auction will be competitive or if you are not sure of your own valuation
  - You set a reservation price
- But the auctioneer never caps the auction price!
- A retailer exposed to an uncapped auction price will have to devise a risk management strategy
- Auction price caps are intended to protect retailers (buyers) from seller market power

Auctions basics (cont)

- If all capacity is forced into an auction without an “offer”, the auction will clear at 0 if there is a surplus available, and it won’t clear if there is a shortage (“infinity”)
- Resources will need to be able to offer a sale price into the auction
- Given that capacity is essentially “sunk” once it is present in the WEM, capacity auction results would reflect, to some extent, market power – or any other constraints imposed
- Different auctions at different times may have very different results due to the particular allocation of credits being auctioned (who owns them, how concentrated is the ownership, etc)

Open Market Observations

- If the “spot” market or auction process is highly volatile and risky → natural incentive to hedge that risk in bilateral market
- Natural incentive for bilateral market and short-term market to track each other
- Extreme case would be an energy-only market – highly volatile short-term market, with extensive use of contracts as risk management instruments
- WEM is not an energy-only market. Nor was it designed to be highly volatile
- But without risk in the capacity market, there will be uncertain incentives in the bilateral contract market

Two-sided

- Removing risk to retailes from bilateral contracting
  - MRCP caps the RCP
  - The negative slope reduces the RCP with excess capacity
  - No super-strong penalties from being at risk of being under contracted
- Increases risk to generators
  - Difficulty obtaining long-term contracts
  - Increased cost of financing
  - Greater exposure to regulatory risk (reduced long-term certainty)
- And vice versa

Options (open discussion)

Interpretation and implementation of MRCP

- Based on a standard reference technology
- Set up as an expected value
- Treated as a maximum value in the RCM
- Risk increased in RCM that long-term investment will be impaired
- 85% of MRCP value is used to set RCP for IMO purchased/sold credits
- The MRCP construct is inconsistent with its use → a risk to the future

Options for role of MRCP

- Treat MRCP as an expected value – allow RCP to exceed MRCP?
  - What about in short-term auctions?
- Change nothing?
- Choice has significant implications for the interpretation and implementation of virtually all other options.

Options

- Spigot control
- Synergy proposal (truth telling + auction)
- Buy/ask spread – bilateralism
- Managed formula
- Do nothing
- Other?

Spigot control

- If there is excess capacity in the RCM, should further capacity credits be issued?

- In markets, when capacity can enter a market freely, the price adjusts to signal when to stop and when more is needed
  - Markets create oversupply and undersupply sometimes
  - Look at US shale gas market for an example of a rampant oversupply and a price response

- Markets that throw up barriers to entry whenever there is “enough” tend to be more insulated and are at risk of being less innovative
  - Again, look at US shale gas – there had been ample “capacity” in the US market before

- On the other hand, the RCP is an administered price and not a free-flowing market price
  - Some degree of quantity control is merited just because the administered price could be wrong and might not adjust enough

What should be the basis for enhanced “spigot” control

- What should be the basis for enhanced “spigot” control?
  - Merely the existence of excess reserve capacity?

- What protections should those who are uncontracted be provided by spigot control?
  - Why should an uncontracted genco investor be protected against new entry risk?

- If the value of reserve capacity credits to customers is less than the reserve capacity price, doesn’t spigot control merely lock in higher costs to end-users?

- What are the elements that should be considered in determining eligibility for capacity credit certification?

Who wins and who loses?

- Spigot control protects uncontracted resources againt the impact of new entrants who, as a result, might reduce the value of capacity credits
  - Is this a good thing?
  - Why?

- Spigot control protects retailers from excess capacity costs given an RCM that does not price-adust effectively

- Spigot control can hurt consumers if it limits innovation and protects higher cost resources in the energy market?

- Would spigot control effectively throw up a barrier to entry that can be used by older capacity resources to prevent newer resources from gaining access to the market (financing costs, etc)

Structured discussion of Synergy Proposal

- Capacity making a bilateral trade declaration is ineligible from receiving an IMO reserve capacity payment
- Undeclared capacity goes into an auction which would set the clearing price
- If no auction then a high administered price would be set by the IMO to facilitate for capacity trades and allow the refund mechanism to function

Synergy Proposal Discussion

- Consequence of a bilateral trade declaration?
  - What if a declaration fails to produce a bilateral trade?
  - What if retailers do not enter into a bilateral contract?
  - Will generation investors still invest if they cannot obtain a bilateral contract?
  - Why should “intentions” matter in any form of commercial market?

- Consequence if undeclared capacity goes into an auction?
  - What type of auction? How often?
  - If someone misses auction 1, when is the next opportunity?
  - An auction clearing price requires that there be a cleared auction quantity?
  - Should the cleared auction quantity be limited to the RCR? Or to all available capacity, needed or not?
  - How does the auction deal with the zero / infinity problem?

Should there be some incentive to force more bilateral trades?

- Consequence of a punitive (high administered price) being set by the IMO to facilitate capacity trades in the event that an auction otherwise fails to clear?
  - Retailers who need credits would face the alternative of a high credit price – subjecting them to generator market power?
  - Would generators receive the high credit price – creating incentives for them to game the auction?

- If retailers pay a punitive price and generators receive a punitive price – they have an incentive to bilaterally contract?

  What makes bilateral contracting preferable?

Is bilateral contracting of capacity a desired end-point to be actively promoted?

- The WA WEM is often called a bilateral market – or, as we have put it, a market with a strong "bilateral DNA"

- The presumption is that bilateral contracting is to be encouraged as a "good" thing in its own right

- Taken to an extreme, this could imply the use of "penalty" values in spot transactions so as to incentivise greater reliance on bilateral contracting

It would be easy (but not costless) to incentivise more bilateral contracting

- Punitively **high** values payable by retailers for capacity credits to cover uncontracted capacity / and punitively **low** payment values to generators for credits purchased to settle uncontracted reserve capacity requirements

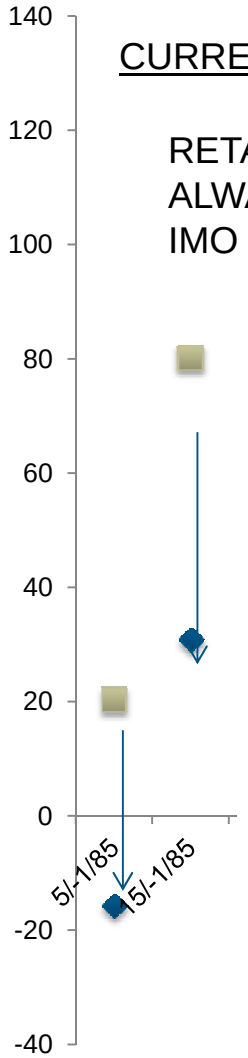
- Market-based auctions that introduce greater credit price volatility (much higher in shortage, much lower in excess) – creating a natural incentive for parties to hedge through contracts to reduce financial risk

- Steeper "slope" mechanisms that raise the level of volatility – particularly insofar as the potential clearing price can be much higher or much lower than the expected value – a "managed" version of an open market pricing pricess

- Ironically, for a market alleged to be based on bilateral contracting, the current "managed" RCM, has limited incentives for stakeholders to bilaterally contract

Current RCM settings do not favour bilateral contracting against any amount of excess reserve capacity *per se*

RETAILER COST (INCLUDING EXCESS CAPACITY)



CURRENT ARRANGEMENT

RETAILERS SHOULD ALWAYS BUY FROM IMO

5% EXCESS CAPACITY VS 15 % EXCESS CAPACITY
SLOPE = -1
MAX RCP = 85% * MRCP

All else equal…..

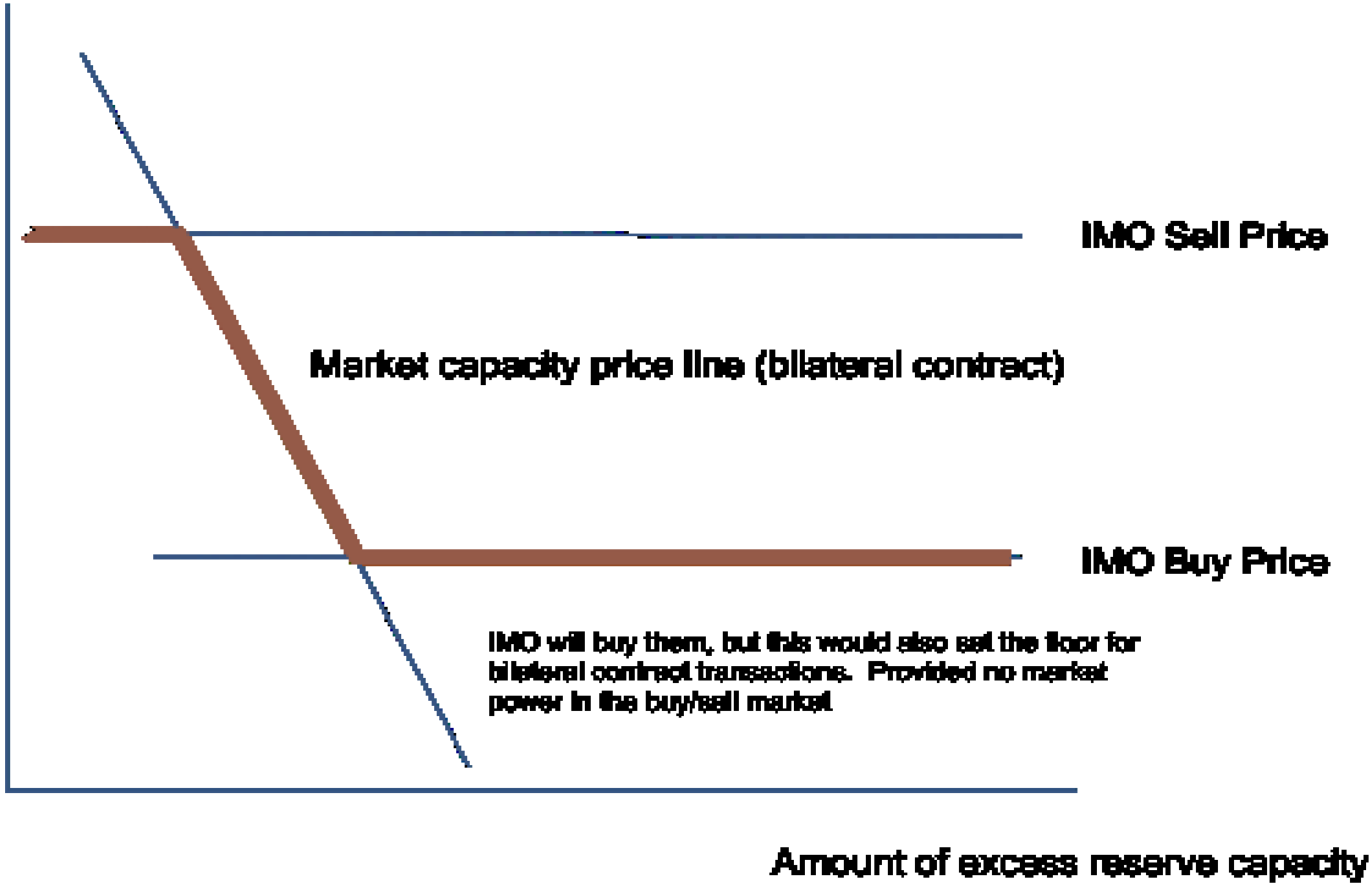
The only incentive to bilaterally contract is the belief that future RCM reviews or settings will be higher than present, such that locking in current costs is preferable

But hedging is not a strategy to manage exposure to excess reserve capacity, per se

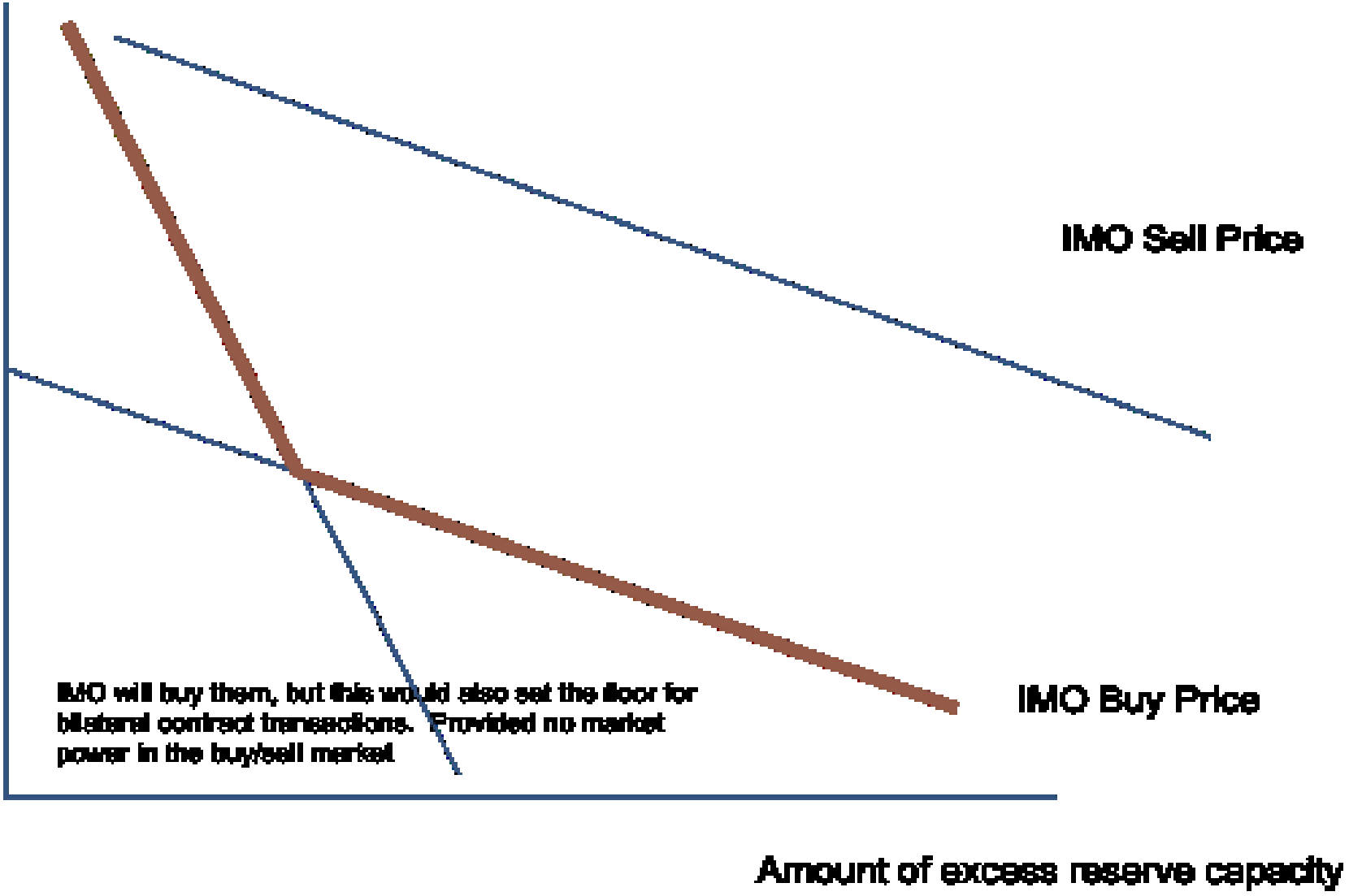
This is because the IMO capacity credit price is always below the MRCP. As long as retail believes future MRCPs will be lower, it has no incentive to contract. If retail believes they will be higher, then you do.

Is this intended?

Buy-ask spread approach (A) would clearly incentivise bilateral contracting according to the size of the spread



Buy-ask spread approach (B) can be incorporated in many other mechanisms



What to do with the middleperson's profits?

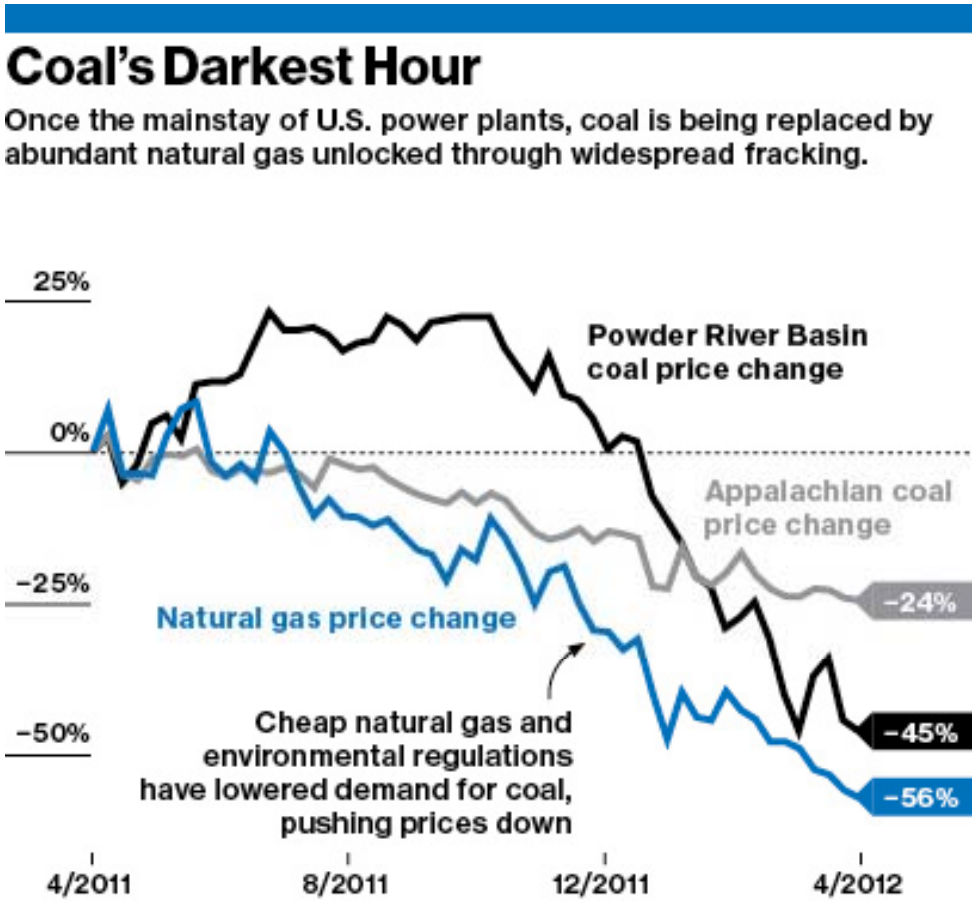
- IMO receives the buy-ask spread
- Refund against fees?
- Refund to franchise customers (presumably those bearing the bulk of costs of excess capacity)?
- Something else?

Forecasting

- Currently we lock in the RCR 2.5 years in advance of a capacity year
  - In the interim, things can change
  - Recent changes have tended to be downward (less growth than expected)
  - The absence of an adjustment mechanism represents a cost
  - But what if it had gone the other way?

Markets can change dramatically

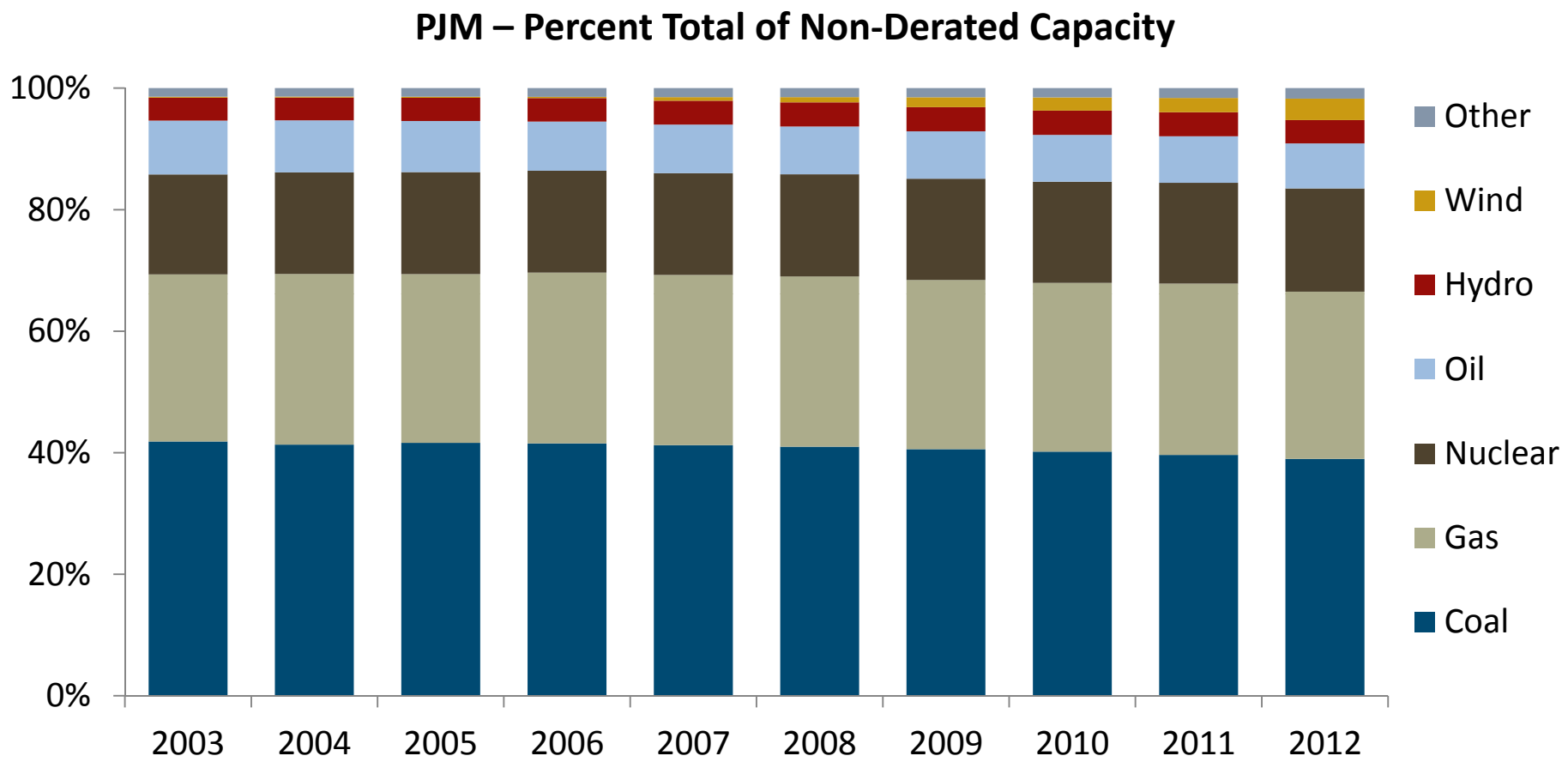
- BusinessWeek's obituary for American coal



With the increase in demand for natural gas stemming from low prices, domestic demand for coal has declined.

Coal prices have also decreased in the US – though not as significantly as natural gas prices

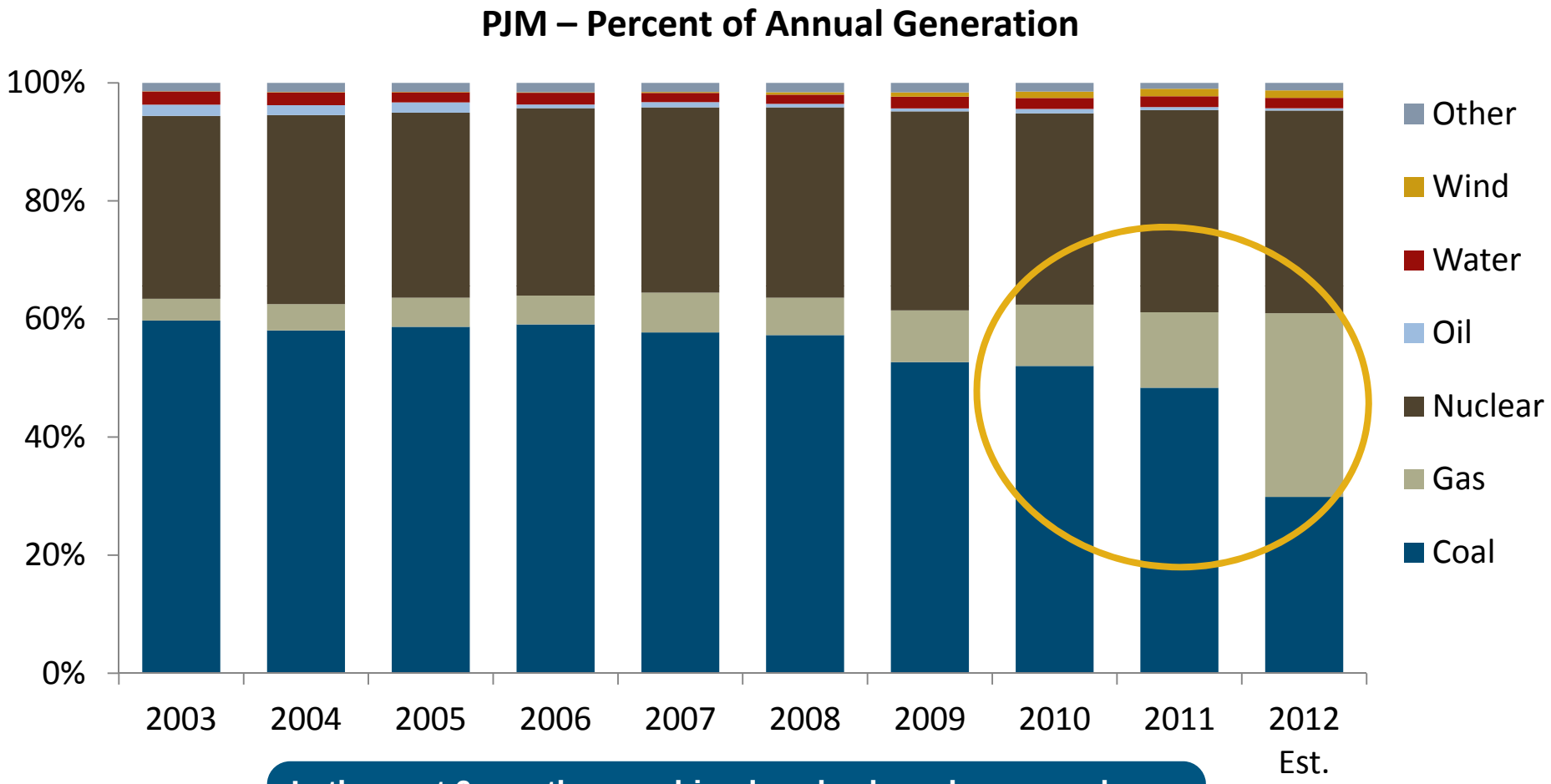
Market Opportunities Worldwide (PJM)



PJM has traditionally been a coal and nuclear dominated market. There are many forecast coal retirements (about 20 GW) due to forthcoming air pollution regulations that take effect in 2015. But there is something even more interesting driving the market these days…

Source: SNL Financial, TLG analysis

Market Opportunities Worldwide (PJM)



In the past 6 months, combined cycles have become a lower marginal cost unit on the supply stack than coal-fired units. This has radically reshaped PJM's generation profile.

Source: SNL Financial, TLG analysis

Forecasting is a dance with uncertainty

- Who bears the risk of forecast errors?

- Generators?
  - If uncontracted?
  - If contracted?

- Retailers / End Users
  - If contracted?
  - If uncontracted?

Some types of changes can dramatically
Increase the amount of reserve capacity
In the WEM – (eg., economic displacement)

Does the WEM facilitate efficient “exit”
Or should the capacity price remain high
even when other factors drive investment?

Block loads are a particular problem in the WA context

- The projected holding requirements may need to reflect available information about these loads
  - If one gets to 1 year out and projected block loads have not (yet) materialised, should they be included or excluded?
  - What can be done to exact stronger commitments from block loads?
  - Should block loads be compelled to bilaterally contract to a minimum percentage in order to be covered?
  - What would be the implication if a block load could not be served in a given year?
- Should block loads be required to purchase capacity credits as an indication of firmness?
- Why should block loads be required to do so 2.5 years ahead of the entry decision?

Other market-based mechanisms incorporate forecast error in reserve capacity requirements

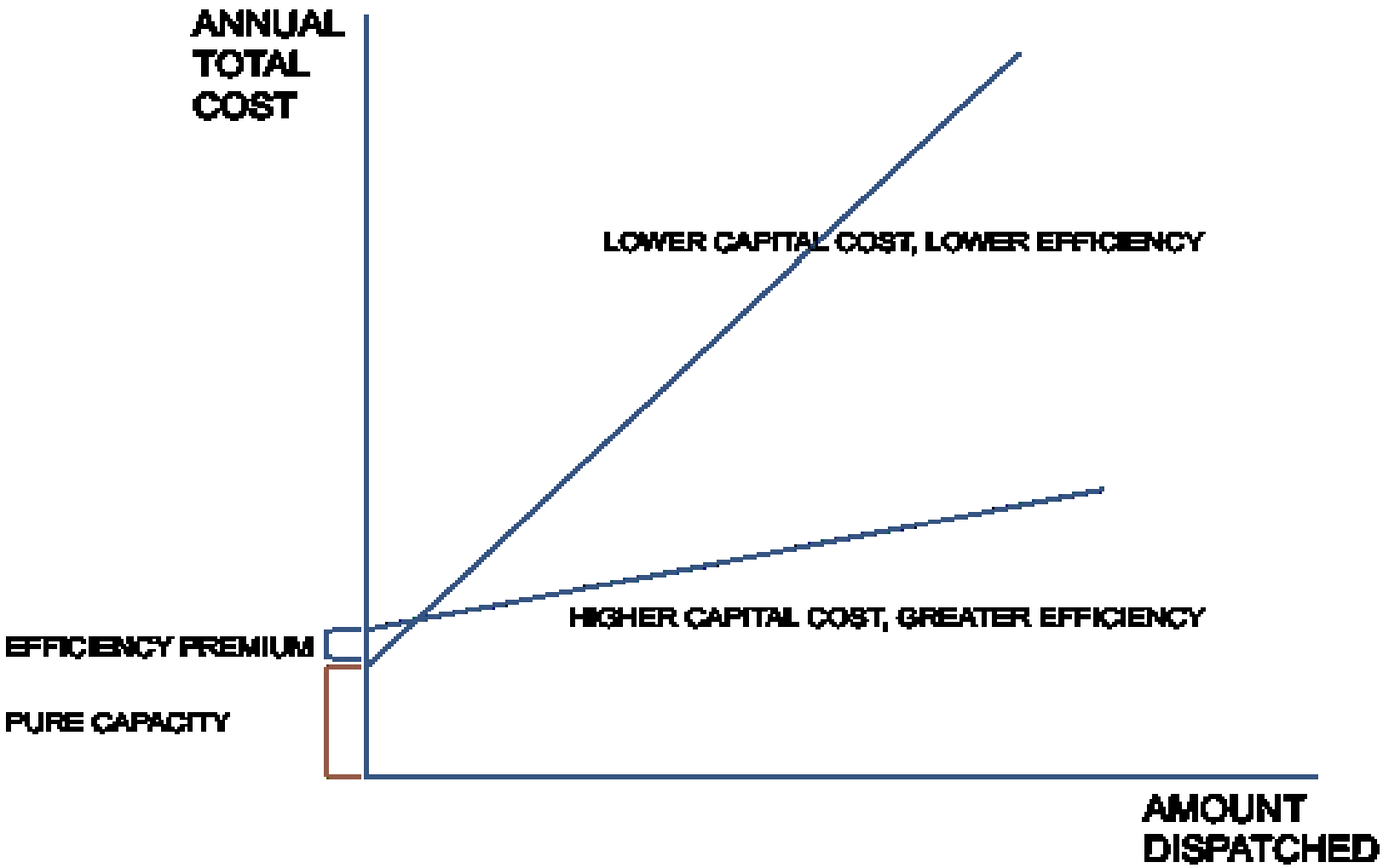
- Say (for example):
  - 0.5 years out must hold 100% of updated RCR, failing which a supplemental auction is held
  - 1 year out, must hold 100% of updated projected RCR
  - 2 years out, must hold at least 90% of updated projected RCR
  - 3 years out, must hold at least 75% of updated projected RCR
  - 4 years out, must hold at least 60% of updated projected RCR
  - 5 years out, must hold at least 40% of projected RCR
- A capacity source that comes into existence “too early” still has value – but the value is related more to future growth in the RCR
- How many auctions and how many auction “products” are suitable for a small market like the WEM?
- Is the complexity a barrier to entry for a new retailer entrant?

Slope option

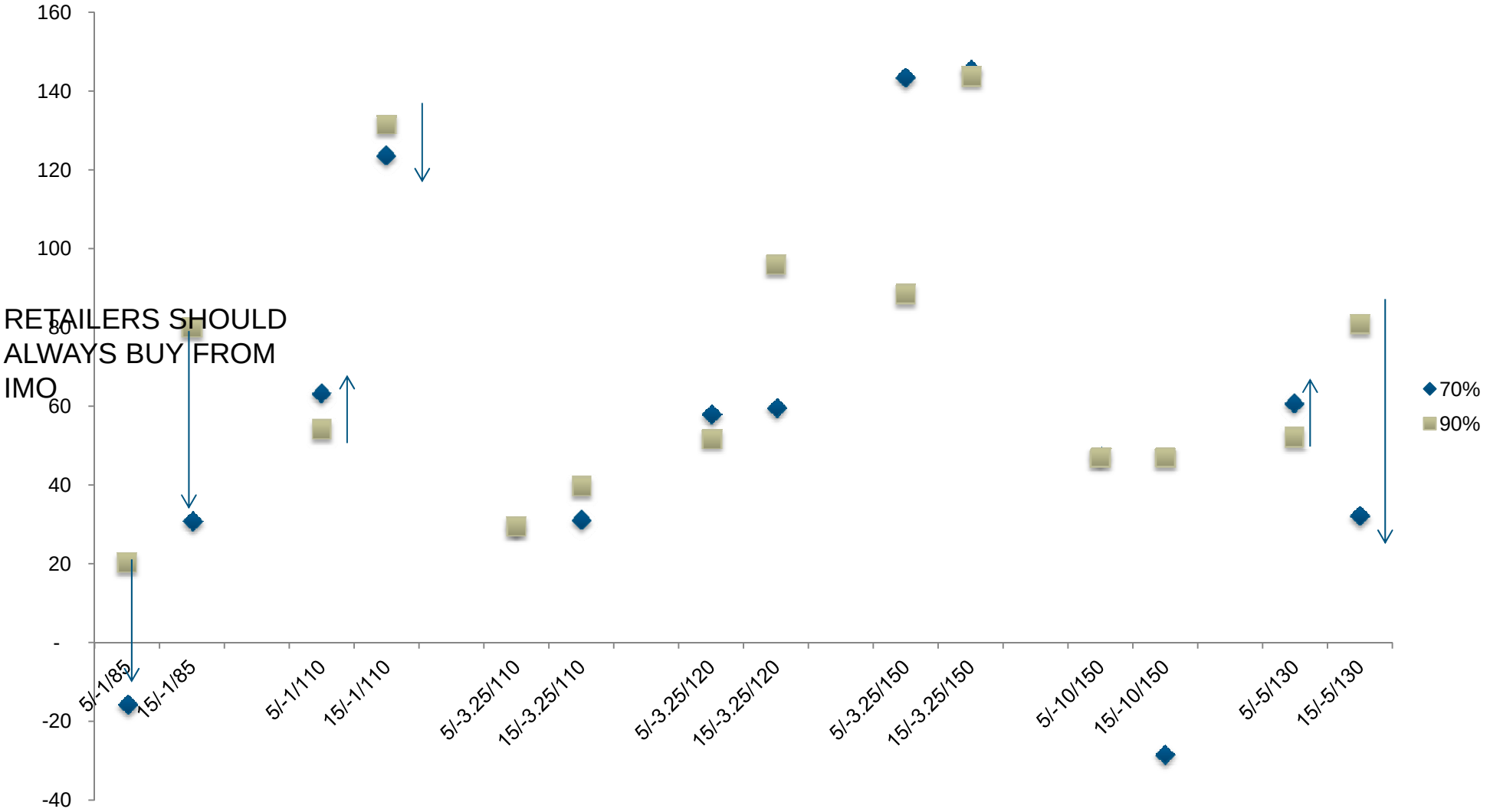
- The slope needs to be steep enough to curtail the risk of unnecessary investment aiming to be supported by excess capacity credits. This determines a minimum slope, which we have estimated to be at least -3.25 as that corresponds to a 15% discount to the reference capacity value. That may not be enough, of course, to absolutely stop all investment that is not needed. But it would certainly have a positive impact relative to the current formula.
- The resulting level needs to be high enough that the RCM can support new capacity when needed (and before relying on a supplementary auction, which is currently designed for essentially emergency situations). This requires that the RCP be able to exceed the MRCP as the amount of excess reserve capacity reduces towards zero.
- The value impact of the resulting slope and level should not be overly disruptive, if possible, so as to avoid or minimize the need for a complex transition mechanism

Slope options versus MRCP of 163,900

	70%	90%	1	5	15
5/-1/85	**-16**	20	**137**	**133**	**121**
15/-1/85	**31**	80			
5/-1/110	63	**54**	179	172	157
15/-1/110	**123**	132			
5/-3.25/110	30	**30**	175	155	121
15/-3.25/110	**31**	40			
5/-3.25/120	58	**52**	190	169	132
15/-3.25/120	**60**	96			
5/-10/150	47	**47**	223	164	98
15/-10/150	**-28**	47			
5/-5/130	61	**52**	203	170	122
15/-5/130	**32**	81			


ANNUAL
TOTAL
COST
LOWER CAPITAL COST, LOWER EFFICIENCY
HIGHER CAPITAL COST, GREATER EFFICIENCY
EFFICIENCY PREMIUM
PURE CAPACITY
AMOUNT
DISPATCHED

SETTING THE MAX RCP > E-MRCP CHANGES INCENTIVES



RETAILERS SHOULD ALWAYS BUY FROM IMO