

# Chapter 7: Market Difference Charges and Difference Payments



# Market Difference Charges and Payments – 1/10

- Since the I-SEM consists of a number of market timeframes, each one is made a reference market for meeting capacity obligations. This means that Capacity Market Units can meet their obligation, and can be exposed to Difference Charges, through trading in any of the energy market timeframes: day-ahead, intraday and balancing. The provision of certain reserves is also allowed to count towards meeting obligations. It also means that Suppliers are protected from the price in all market timeframes, as they are hedged against the price through Difference Charges in each timeframe.
- The complexity of dealing with the interactions of the charges in all of these timeframes is managed through multiple layers of settlement algebra. While it appears complicated, this algebra can be explained as trying to implement a number of principles for the interaction of these charges.

# Market Difference Charges and Payments – 2/10

- All markets are reference markets, i.e. can meet capacity obligation with, and be hedged against prices in:
  - Traded quantities in Day-ahead Market (charges and payments);
  - Traded quantities in Intraday Market (charges and payments);
  - Accepted quantities in Balancing Market (charges only);
  - Provision of certain reserve system services (charges only);
  - Imbalances (payments only).
- The complexity in the settlement algebra is trying to implement the following philosophies:
  - Don't expose/make eligible the same quantity multiple times, only once;
  - Where the quantity is traded first is where it is exposed / eligible;
  - The reference price is the price associated with the traded quantity;
  - Only charge for quantities selling power, only pay for quantities buying power;
  - If a trade increases the unit's balancing obligation (i.e. they have to provide more energy), it should reduce their remaining capacity obligation (i.e. that amount would not be seen as non-performance), and vice versa.

# Market Difference Charges and Payments – 3/10

- The first principle relates to when capacity of a unit is traded in the energy market more than once. Imagine a unit has traded to a certain position in the day-ahead market, then traded out of that position, and back into that position, multiple times in opposite directions in the intraday market. Despite the fact that there are multiple trades in opposite directions, they all just represent a single capacity position of the unit provided through the net position of those trades, and therefore only a single trade representing this capacity position should be exposed to the charge. The capacity is only delivered (through trades) once, even if the energy amounts for that capacity have been traded multiple times, and therefore there needs to be a single reference price for the capacity delivered.
- A similar mirrored principle is present in terms of the hedge for demand: while there may be multiple energy trades in opposite directions, it all just represents a single demand consumption position, and therefore only a single trade representing this demand consumption position should be eligible for the hedge.
- Another principle which builds this one is that the single trade taken as exposed to the charge, or eligible for the hedge payment, is based on where the capacity or demand position was traded first. This means the capacity or demand position can be traded multiple times but only exposed to charges or eligible for payments for the first trade.

# Market Difference Charges and Payments – 4/10

- The next principle is on the reference price, which is the price of the traded quantities. For those who have traded in the day-ahead market there is one price for the I-SEM zone and therefore it is easy to identify the reference price. However, when considering balancing market or intraday market trades, every single individual unit trade quantity could have a different price associated with it. Because of this, the reference price for each trade is taken to be the price at which that trade is settled through energy payments or charges.
- The next principle relates to the sign or the direction of trades considered. For Capacity Market Units, only the quantities which represent selling power (positive quantities which can be seen as the provision of capacity through trades) are exposed to charges, and similarly for Suppliers only quantities which represent buying power (negative quantities) are eligible for the payments to enact the hedge.

# Market Difference Charges and Payments – 5/10

- The final principle also relates to when a trade is determined to contribute to the provision of capacity, and this one is based on the net effect of all trades. It is important to ensure that if a Participant trades out of a position that this is reflected in increasing the Non-Performance Difference Quantity. Otherwise a Participant could meet their capacity obligation through taking on a physical obligation in earlier trades, trade out of this physical obligation in later trades while keeping their capacity obligation fulfilled, therefore severely limiting the reliability incentive provided through Non-Performance Difference Charges.
- The algebra ensures that there is an inverse relationship between increasing energy obligation and decreasing capacity obligation, so that if a unit trades out of its energy position, it would be seen as non-performance against the capacity obligation.
- This could be thought of more simply as a see-saw effect: the more power is provided through increasing the net traded quantities then the less additional trades need to be provided before the capacity obligation is fully met, the less power is provided through decreasing the net traded quantities then the more additional trades need to be provided before the capacity obligation is fully met.

# Market Difference Charges and Payments – 6/10

- This has an important interaction with the principle of not exposing capacity multiple times through applying difference charges to multiple trades. In the case where a unit has traded out of or decreasing its imbalance position, it is increasing the amount of its capacity obligation no longer being met and therefore the volume exposed to Non-Performance Difference Charges.
- Since this volume is now exposed to Non-Performance Difference Charges based on the net position of the energy market trades, any traded volume above this net position should not be exposed to difference charges because then that part of the unit's capacity would be exposed a number of times – once through a market Difference Charge, and again through Non-Performance Difference Charges.
- This is managed by taking into account the net energy trading position of the unit in the algebra used to calculate the quantities to which Difference Charges apply, and the quantity of the obligation met.

# Market Difference Charges and Payments – 7/10

- In order to implement all of this, a systemic approach is taken to ensure that the correct quantities are calculated to be exposed to a charge or eligible for a payment taking into account all of these principles. Subsequently, if the trade price is greater than the strike price then a charge or a payment is calculated, otherwise for that trade there is none.
- The complication lies around working out the quantities. The approach taken is to look at every single trade from the day-ahead, intraday and balancing markets. These are all lined up in the order that they were accepted. The next step is to look at one of those trades and calculate the quantity of it that is exposed to the difference charges or eligible for the difference payments. To ensure the right amount is calculated, tracking variables which keep track of the net trade position of all trades prior to the one considered are used. The purpose of this is that if something was traded already it is not going to be double-exposed to difference charges.
- There are also capping variables in place. CMUs need to trade up to the level to meet their obligations in the capacity market, and those trades are exposed to difference charges, however any trades beyond the obligated level should not be exposed. If the CMU trades up that obligated level, then the calculations for difference charges ensure that the quantity of trades above that level are not exposed to being charged by using a combination of the tracking variables and capping variables to calculate the exposed quantity to be zero.

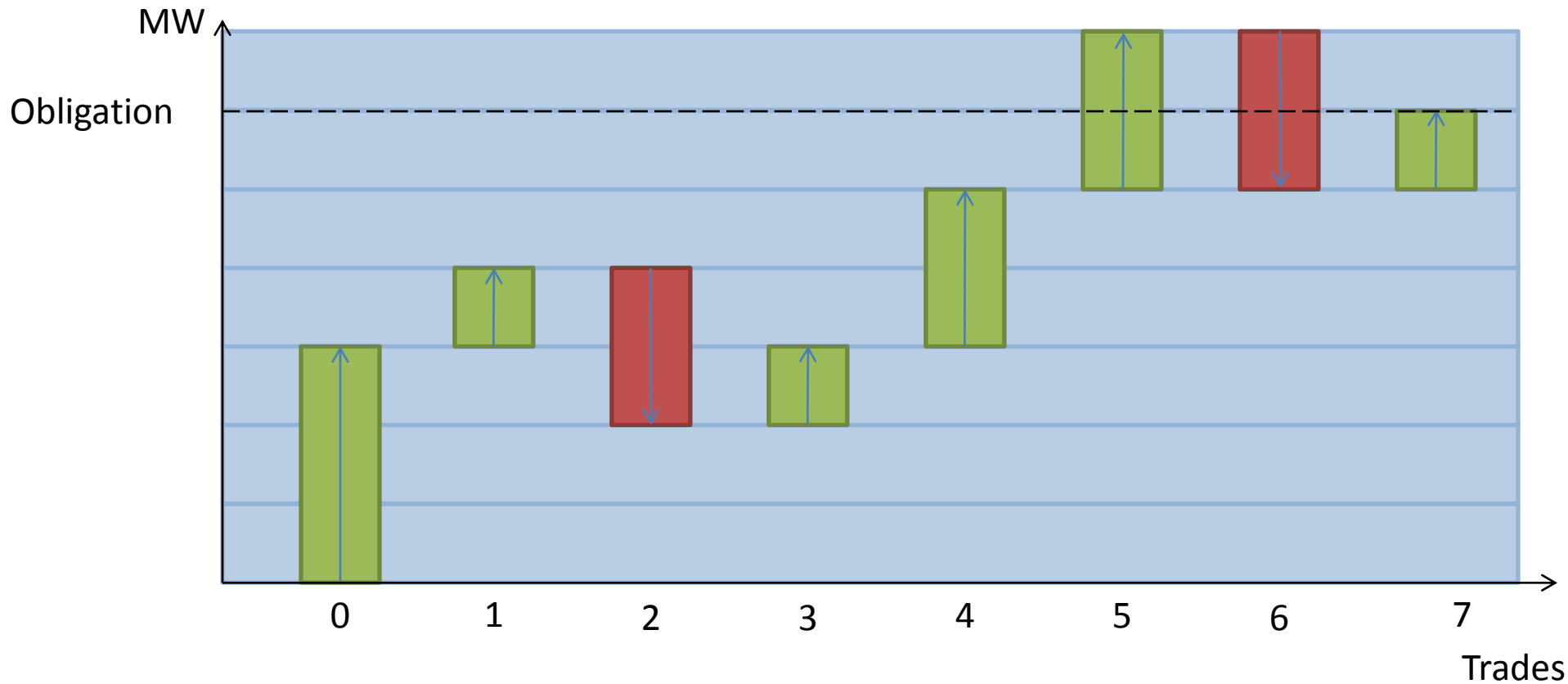


# Market Difference Charges and Payments – 8/10

- The principles are implemented in a mechanism which can be explained with the following three step iterative process, looking at each trade in order of acceptance:
  1. Calculate the quantity of that trade which is to be exposed to Difference Charges / eligible for Difference Payments, considering:
    - A. Tracking variables (has this quantity been traded before? If so, don't expose it / make it eligible again);
    - B. Capping variables (will this quantity be traded back again in future trades, or has the unit met its obligation already? If so, don't expose it / make it eligible).
  2. Calculate the Difference Charge or Difference Payment for that exposed / eligible quantity if the trade price is above the strike price;
  3. Update the tracking variables to account for changes to capacity obligations having been met from this trade.
- Repeat the three steps with the next trade, until there are no trades left.
- Once the quantity has been calculated, then the charge can be calculated as the quantity times the difference between the trade price and the Strike Price.
- The following slides show a simple example of the trading a CMU does for a single period, and the resulting quantities which are can be exposed to difference charges. More examples will be given as part of Instructor Led Training.

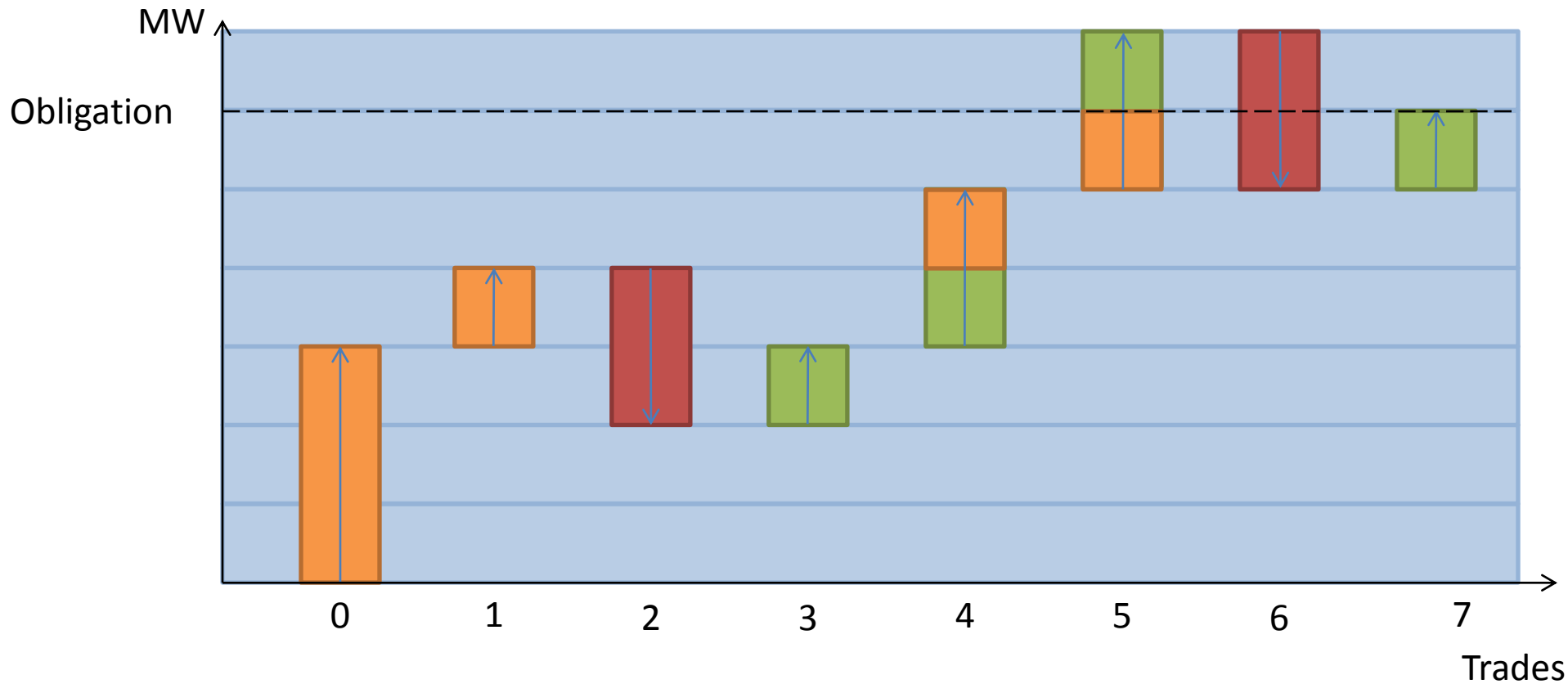
# Market Difference Charges and Payments – 9/10

- Day-ahead and Intraday trades:



# Market Difference Charges and Payments – 10/10

- Day-ahead and Intraday trades:



 Quantity for Difference Charge if Trade Price > Strike Price